McLennan COMMUNITY COLLEGE

WACO, TEXAS

COURSE SYLLABUS

AND

INSTRUCTOR PLAN

General Chemistry for Engineering Majors

Chem 1409_02

Larry D. Benton

NOTE: This is a 16-week course.

COVID 19 Notice:

McLennan Community College is committed to providing you with every resource you need to reach your academic goals including your safety. We will continue to monitor the evolving situation with COVID 19 and adjust our safety guidelines to make sure we offer a safe environment for you and our faculty. Please make sure to consult your faculty and the MCC website at https://www.mclennan.edu/crisis-management/coronavirus-updates/index.html on any changes to these guidelines.

Course Description:

Fundamental principles of chemistry for engineering majors; topics include measurements, fundamental properties of matter, states of matter, chemical reactions, acid-base concepts, chemical stoichiometry, periodicity of elemental properties, atomic structure, chemical bonding, molecular structure, solutions, properties of gases, phase-diagrams, introduction to chemical equilibrium, chemical thermodynamics, electrochemistry, and an introduction to descriptive inorganic chemistry and organic chemistry. Basic laboratory experiments supporting theoretical principles presented in CHEM 1309; introduction of the scientific method, experimental design, chemical instrumentation, data collection and analysis, and preparation of laboratory reports.

Prerequisites and/or Corequisites:

Prerequisites: MATH 1314 with a minimum grade of C or
equivalent preparation.

Course Notes and Instructor Recommendations:

In order to excel in this class, expect to spend 5 to 6 hours per week completing homework assignments, and reviewing material covered in the lectures associated with this class. Lab work will require the student reviewing the lab manual instructions for the lab prior to attending the lab. PowerPoint presentations and additional study aids for will available on Brightspace for the students review as well.

Instructor Information:

Instructor Name: Larry D. Benton
MCC E-mail: lbenton@mclennan.edu
Office Phone Number: (254) 299-8195
Office Location: Science Building SB 310 (Third Floor)
Office/Teacher Conference Hours: TBA
Other Instruction Information:

Required Text & Materials:

Title: Chemistry: Molecular Nature of Matter & Change
Author: Silberburg
Edition: 9th
Publisher: McGraw- Hill
ISBN: 9781265947842 or 9781264505463
Note that you will not need Mcgraw- Hill Connect for this class unless you use the e-book.

MCC Bookstore Website: http://www.mclennan.edu/bookstore/

A laboratory notebook, the laboratory manual, and safety goggles, all available at the bookstore are required. An alternative for safety goggles, that many students have found to be very comfortable, is the Uvex Stealth OTG Safety Goggles that can be purchased from major online sites.

Methods of Teaching and Learning:

This class consists of three hours per week of solving problems during the lecture time from the assigned chapter and 3 hours per week of laboratory experimentation. The lecture portion of the class will be problems worked on the whiteboard, and open discussion. The student is expected to study the PowerPoint presentations for each chapter and read the assigned chapter in the book. Problems worked will be real world chemical problems that are solved using mathematics to find absolute solutions. The student is expected to capable of using algebraic methods to solve mathematical problems.

The laboratory portion of the class is conducted with each student experiencing hands on experimentation in the lab. The student's review of the lab experiment prior to execution will enhance the learning experience. Students may be required to work individually or in groups. Learning to work cooperatively in the laboratory setting is an important aspect of the lab.

Course Objectives and/or Competencies:

Critical Thinking: Students' critical thinking abilities will be assessed through written lecture exams and/or lab reports.

Communication: Students will be required to research a topic relevant to the semester's coursework for presentation to a group of peers and faculty. Communication is also evaluated through testing, reporting of lab results and embedded research projects that require formalized reports.

Empirical/Quantitative: Students will be required to perform chemistry calculations on lecture exams and during weekly lab experiments and exercises. Emphasis is given to mathematical descriptions of the topics covered since this course is focused on the science and engineering student. Students are required to collect data and determine the implications the collected data set has in relation to the environment and the world around them.

Teamwork: Students will work in teams for each laboratory exercise. Each member of the team will carry some responsibility for data collection and/or interpretation.

Learning Outcomes:

Lecture

Upon successful completion of this course, students will:

1. Define the fundamental properties of matter.
2. Classify matter, compounds, and chemical reactions.
3. Convert units of measure and demonstrate dimensional analysis skills.
4. Determine the basic nuclear and electronic structure of atoms.
5. Identify trends in chemical and physical properties of the elements using the Periodic Table.
6. Describe the bonding in and the shape of simple molecules and ions.
7. Solve stoichiometric problems.
8. Use the rules of nomenclature to name chemical compounds.
9. Write chemical formulas.
10. Write and balance equations.
11. Define the types and characteristics of chemical reactions including acids and bases.
12. Use the gas laws and basics of the Kinetic Molecular Theory to solve gas problems.
13. Articulate the importance of intermolecular interactions and predict trends in physical properties.
14. State the characteristics of liquids and solids, including phase diagrams and spectrometry.
15. Apply the principles of equilibrium to chemical systems using Le Chatelier's Principle to predict the effects of concentration, pressure, and temperature changes on equilibrium mixtures.
16. Analyze and perform calculations with the thermodynamic functions, enthalpy, entropy, and free energy.
17. Discuss the construction and operation of galvanic and electrolytic electrochemical cells, and determine standard and non-standard cell potentials.
18. Understand the basic theory of chemical kinetics and rudimentary grasp of factors effecting the kinetics of chemical reactions.

Laboratory

Upon successful completion of this course, students will:

1. Use basic apparatus and apply experimental methodologies used in the chemistry laboratory.
2. Demonstrate safe and proper handling of laboratory equipment and chemicals.
3. Conduct basic laboratory experiments with proper laboratory techniques.
4. Make careful and accurate experimental observations.
5. Relate physical observations and measurements to theoretical principles.

6. Interpret laboratory results and experimental data, and reach logical conclusions.
7. Record experimental work completely and accurately in laboratory notebooks and communicate experimental results clearly in written reports.
8. Design fundamental experiments involving principles of chemistry and chemical instrumentation.
9. Identify appropriate sources of information for conducting laboratory experiments involving principles of chemistry.

Course Outline or Schedule:

Week 1 - Introduction, Chapters 1 and 2
Week 2 - Chapters 1, 2 and 3
Week 3 - Review Chapters 1, 2, and 3 Test over Chapters 1, 2, and 3
Week 4 - Chapter 4 and 5
Week 5 - Chapter 6, Review Chapters 4, 5, and 6
Week 6 - Test over Chapters 4, 5, and 6 Chapter 7
Week 7 - Chapters 8, 9, 10, and 11
Week 8 - Test over Chapters 7, 8, 9, 10, and 11 Chapter 12
Week 9 - Chapters 13 and 14
Week 10 - Chapters 16 and 17 Online Test for Chapters 12, 13, and14 Posted
Week 11 - Test for Chapters 16, and 17 Chapter 18
Week 12 - Chapter 19 , Test for Chapters 19 and 20
Week 13 - Chapters 20 and21
Week 14 - Test for Chapters 20 and 21
Week 15 - Chapters 22 and 24, Online Quizz over Chapters 22 and 24, Make Up Exam
Week 16 - Final Exam
This schedule is subject to change.

Course Grading Information:

Your course grade will be based on the points received from the exams, the final, the lab grades, class participation (attendance and involvement in class) and the periodic exercise problems. There will be five (5) 100-point exams. A single make-up exam will be offered for the chapter exams as scheduled. A time and day will be scheduled prior to the end of the semester for all students who missed a test to take the makeup exam. The exam will be comprehensive up to that point in the course. The final will be a 100 point comprehensive final and will be given on the final exam date. There will not be a makeup test for the final exams. There will be homework exercise problems to be turned in and graded. Twelve labs will be given with the lab report to be turned in and graded at the end of each lab. Your grade will be calculated using the following breakdown:

In Class Exams	**40%**
Lab Notebook	**10%**
Lab Grades	**20%**
Online Chapter Quizzes	**15%**
Final	**15%**

Your course letter grade will be based on the following scale: 90% or more of the total points will guarantee a grade of "A"; 80% or more guarantees "B"; 70% or more guarantees "C"; 60% or more guarantees "D"; below 60% of the total may result in an "F".

Work that is not easily readable and meets English grammatical standards will not be graded. Mathematical solutions must be written in an easily followed "proof" format and should be appropriately commented.

Late Work, Attendance, and Make Up Work Policies:

Lab worksheets are due by the start of the next week's lab. Make up labs are NOT offered. One make up exam is offered at the end of the semester. The makeup exam will be a comprehensive exam of the material covered in the semester. Students are responsible for identifying each paper turned in with their name in the upper margin of each page. Papers that are turned in without names or pages from work turned without names are discarded. Work that is not legible will not be graded and a zero will be recorded for that assignment. Proper grammar and punctuation is required for answers to essay questions. Proper format using a mathematical proof style is required for math related problems.

The laboratory manual has a pre-lab assignment which is to be completed prior to the students' lab period. Failure to complete the pre-lab may result in the student not being allowed into the lab to perform the lab experiment and will result in the student not getting a grade for that lab. It is of upmost importance that the student thoroughly reads and studies the lab experiment prior to attempting to execute the experiment. Inherent hazards associated with working in a laboratory setting can be minimized by studying the experiment before performing the experiment.
Late work will not be accepted. Each assignment will have a due date attached to the assignment.

MCC attendance policy will be enforced. The student should be certain to use the link below to read the attendance policy, so the policy can be observed.

Student Behavioral Expectations or Conduct Policy:

If there is any evidence of cheating on any homework, quiz, test, or final, you will receive a zero for that item and cannot make it up or replace it and it cannot be dropped. Tobacco and tobacco product use is prohibited inside college buildings. This includes smokeless products as well as cigarettes, pipes, and cigars.

Safety equipment must be worn at all times: long pants/skirt (covering at least the top half of the calf), apron or lab coat, hair back, safety goggles, and, if necessary, gloves. No open-toed shoes, shoes with holes in them, shoes that leave the top of the foot exposed, hats of any sort, shorts, food or drink are allowed. Anyone acting in an unsafe manner will be warned once. If seen without safety equipment or acting improperly a second time, they will be asked to leave the laboratory. They will be allowed to return in 30 minutes to finish their work, if they can. If they are asked to leave more than once for any given experiment, they will receive a zero for that experiment's lab report. Safety is the MOST important part of lab. Students must abide by the general safety regulations as described in the chemistry 1411 laboratory manual.

Please read and abide to the General Conduct Policy in the Highlander Guide.

Click Here for the MCC Attendance/Absences Policy
(https://www.mclennan.edu/highlander-guide/policies.html)

Click on the link above for the college policies on attendance and absences. Your instructor may have additional guidelines specific to this course.

McLennan COMMUNITY COLLEGE

ACADEMIC RESOURCES/POLICIES

Accommodations/ADA Statement:
Any student who is a qualified individual with a disability may request reasonable accommodations to assist with providing equal access to educational opportunities. Students should contact the Accommodations Coordinator as soon as possible to provide documentation and make necessary arrangements. Once that process is completed, appropriate verification will be provided to the student and instructor. Please note that instructors are not required to provide classroom accommodations to students until appropriate verification has been provided by the Accommodations Coordinator. For additional information, please visit www.mclennan.edu/disability.

Students with questions or who require assistance with disabilities involving physical, classroom, or testing accommodations should contact:

disabilities@mclennan.edu
254-299-8122
Room 319, Student Services Center

Title IX:
We care about your safety, and value an environment where students and instructors can successfully teach and learn together. If you or someone you know experiences unwelcomed behavior, we are here to help. Individuals who would like to report an incident of sexual misconduct are encouraged to immediately contact the Title IX Coordinator at titleix@mclennan.edu or by calling Dr. Drew Canham (Chief of Staff for Diversity, Equity & Inclusion/Title IX) at (254) 299-8645. Individuals also may contact the MCC Police Department at 299-8911 or the MCC Student Counseling Center at MCC at (254) 299-8210. The MCC Student Counseling Center is a confidential resource for students. Any student or employee may report sexual harassment anonymously by visiting http://www.lighthouse-services.com/mclennan/.

Go to McLennan's Title IX webpage at www.mclennan.edu/titleix/. It contains more information about definitions, reporting, confidentiality, resources, and what to do if you or someone you know is a victim of sexual misconduct, gender-based violence or the crimes of rape, acquaintance rape, sexual assault, sexual harassment, stalking, dating violence, or domestic violence.

Student Support/Resources:
MCC provides a variety of services to support student success in the classroom and in your academic pursuits to include counseling, tutors, technology help desk, advising, financial aid, etc. A listing of these and the many other services available to our students is available at http://www.mclennan.edu/campus-resource-guide/

College personnel recognize that food, housing, and transportation are essential for student success. If you are having trouble securing these resources or want to explore strategies for balancing life and school, we encourage you to contact a Success Coach by calling (254) 299-8226 or emailing SuccessCoach@mclennan.edu. Students may visit the Completion Center Monday-Friday from 8 a.m.-5 p.m. to schedule a meeting with a Success Coach and receive additional resources and support to help reach academic and personal goals. Paulanne's Pantry (MCC's food pantry) provides free food by appointment to students, faculty and staff based on household size. Text (254) 870-7573 to schedule a pantry appointment. The Completion Center and pantry are located on the Second Floor of the Student Services Center (SSC).

MCC Foundation Emergency Grant Fund:
Unanticipated expenses, such as car repairs, medical bills, housing, or job loss can affect us all. Should an unexpected expense arise, the MCC Foundation has an emergency grant fund that may be able to assist you. Please go to https://www.mclennan.edu/foundation/scholarships-and-resources/emergencygrant.html to find out more about the emergency grant. The application can be found at https://www.mclennan.edu/foundation/docs/Emergency_Grant_Application.pdf.

MCC Academic Integrity Statement:
Go to www.mclennan.edu/academic-integrity for information about academic integrity, dishonesty, and cheating.

Minimum System Requirements to Utilize MCC's D2L|Brightspace:
Go to https://www.mclennan.edu/center-for-teaching-and-learning/Faculty-and-Staff-Commons/requirements.html for information on the minimum system requirements needed to reliably access your courses in MCC's D2L|Brightspace learning management system.

Minimum Technical Skills:
Students should have basic computer skills, knowledge of word processing software, and a basic understanding of how to use search engines and common web browsers.

Backup Plan for Technology:
In the event MCC's technology systems are down, you will be notified via your MCC student email address. Please note that all assignments and activities will be due on the date specified in the Instructor Plan, unless otherwise noted by the instructor.

Email Policy:
McLennan Community College would like to remind you of the policy (http://www.mclennan.edu/employees/policy-manual/docs/E-XXXI-B.pdf) regarding college email. All students, faculty, and staff are encouraged to use their McLennan email addresses when conducting college business.

A student's McLennan email address is the preferred email address that college employees should use for official college information or business. Students are expected to read and, if needed, respond in a timely manner to college emails.

Instructional Uses of Email:
Faculty members can determine classroom use of email or electronic communications. Faculty should expect and encourage students to check the college email on a regular basis. Faculty should inform students in the course syllabus if another communication method is to be used and of any special or unusual expectations for electronic communications.

If a faculty member prefers not to communicate by email with their students, it should be reflected in the course syllabus and information should be provided for the preferred form of communication.

Email on Mobile Devices:
The College recommends that you set up your mobile device to receive McLennan emails. If you need assistance with set-up, you may email Helpdesk@mclennan.edu for help.

Forwarding Emails:
You may forward emails that come to your McLennan address to alternate email addresses; however, the College will not be held responsible for emails forwarded to an alternate address that may be lost or placed in junk or spam filters.

Disclaimer:
The resources and policies listed above are merely for informational purposes and are subject to change without notice or obligation. The College reserves the right to change policies and other requirements in compliance with State and Federal laws. The provisions of this document do not constitute a contract.