COURSE SYLLABUS
AND
INSTRUCTOR PLAN

GENERAL INORGANIC CHEMISTRY II
CHEM 1412.01

Larry Benton

WACO, TEXAS

AN EQUAL OPPORTUNITY INSTITUTION

Summer II 2019
Course Description:
Students will study chemical equilibrium, phase diagrams and spectrometry, acid-base concepts, thermodynamics, kinetics, electrochemistry, nuclear chemistry, an introduction to organic chemistry and descriptive inorganic chemistry. Basic laboratory experiments supporting theoretical principles; introduction of the scientific methods, experimental design, chemical instrumentation, data collection and analysis, and preparation of laboratory reports will be performed.

Prerequisites and/or Corequisites:
Prerequisite: CHEM 1411 with a minimum grade of C. Semester Hours 4 (3 lec/4 lab)

Course Notes and Instructor Recommendations:
A scientific calculator and a laboratory notebook (available from the Bookstore) is required for this course.

Instructor Information: Instructor
Name: Larry D. Benton MCC E-mail: lbenton@mclennan.edu Office Phone
Number: 254-299-8195
Office Location: SB 310
Office/Teacher Conference Hours: Posted Outside of Office Door
Other Instruction Information:

Required Text & Materials:
Title: A Molecular Approach
Author: Nivaldo J. Tro
Edition: Fourth Edition
Publisher: Pearson

Laboratory Notebook (Available from the Bookstore)
Goggles (Available from Bookstore and Amazon)
Scantron forms for In Class exams.

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

* **Click Here for the Minimum System Requirements to Utilize MCC’s D2L|Brightspace** (www.mclennan.edu/center-for-teaching-and-learning/teaching-commons/requirements) Click on the link above for information on the minimum system requirements needed to reliably access your courses in MCC’s D2L|Brightspace learning management system.

**Methods of Teaching and Learning:**
This class consists of three lectures per week of solving problems during the lecture time from the assigned chapters and three sessions per week of laboratory experimentation. One lecture per week (Monday) will be used for testing over the previous weeks lecture. 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 be 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. Safety and cleanliness in the lab is of paramount importance. Failure to keep the working space clean will result in a reduction to your lab grade.

**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 some of the laboratory exercises. Each member of the team will carry some responsibility for data collection and/or interpretation. Other experiments will be carried out individually.

**Learning Outcomes:**

**Lecture**
Upon successful completion of this course, students will:
1. State the characteristics if liquids and solids, including phase diagrams and spectrometry.
2. Articulate the importance of intermolecular interactions and predict trends in physical properties.
3. Identify the characteristics of acids, bases, and salt, and solve problems based on their quantitative relationships.
4. Identify and balance oxidation-reduction equations, and solve redox titration problems.
5. Determine the rate of reaction and its dependence on concentration, time, and temperature.
6. Apply the principles of equilibrium to aqueous systems using LeChatelier’s Principle to predict the effects of concentration, pressure, and temperature changes on equilibrium mixtures.
7. Analyze and perform calculations with the thermodynamic functions, enthalpy, entropy and free energy.
8. Discuss the construction and operation of galvanic and electrolytic cells, and determine standard and non-standard cell potentials.
9. Define nuclear decay process.
10. Describe basic principles of organic chemistry and descriptive inorganic chemistry.

**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.
9. Identify appropriate sources of information for conducting laboratory experiments involving principles of chemistry.

**Course Outline or Schedule:**

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
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<tbody>
<tr>
<td>Week 1</td>
<td>Introduction to the class, Chapter 7 and 8</td>
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<tr>
<td>Week 2</td>
<td>Chapters 9, 10, 11 and 12</td>
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<tr>
<td>Week 3</td>
<td>Chapter 13, 14 and 15</td>
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<tr>
<td>Week 4</td>
<td>Chapters 16, 17, and 16</td>
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<tr>
<td>Week 5</td>
<td>Chapters 17, and 18</td>
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<tr>
<td>Make Up Exam</td>
<td>August 12</td>
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<tr>
<td>Final exam</td>
<td>August 13</td>
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**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. The top ten lab grades will be counted toward your final grade. Your grade will be calculated using the following breakdown:

- **In Class Exams** 40%
- **Lab Notebook** 5%
- **Lab grades** 20%
- **Take Home Exams** 20%
- **Final** 10%
- **Research report** 5%

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 readable and meeting basic English grammatical standards will not be graded. Mathematical solutions must be written in an easily followed mathematical proof style format and should be appropriately commented.

Laboratory notebooks must have the students name prominently displayed in the title page of the notebook, otherwise the notebook will not be graded.

**Late Work, Attendance, and Make Up Work Policies:**
Late work will not be accepted. Take Home Tests (Homework) is due immediately prior to the related test. Lab reports are due by the start of the next week’s lab. Make up labs are NOT offered with the following exception. 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.

**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 Academic Integrity Statement
(www.mclennan.edu/academic-integrity)
The link above will provide you with information about academic integrity, dishonesty, and cheating.

* Click Here for the MCC Attendance/Absences Policy
(www.mclennan.edu/highlander-guide/policies)
Click on the link above for the college policies on attendance and absences. Your instructor may have guidelines specific to this course.

**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. Instructors should not provide accommodations unless approved by the Accommodations Coordinator. For additional information, please visit 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

* Click Here for more information about Title IX
(www.mclennan.edu/titleix)
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 (Vice President for Student Success) at
299-8645. Individuals also may contact the MCC Police Department at 299-8911 or the MCC Student Counseling Center at MCC by calling 299-8210. The MCC Student Counseling Center is a confidential resource for students.

McLennan’s Title IX webpage (http://www.mclennan.edu/titleix/) 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.

* You will need to access each link separately through your Web browser (for example: Internet Explorer, Mozilla, Chrome, or Safari) to print each link’s information.