



**Division:** Natural Sciences and Mathematics

**Department:** Chemistry

## **CHEM 1412: GENERAL CHEMISTRY II / Summer 2017**

### **CATALOG DESCRIPTION:**

A continuation of CHEM 1411 with studies in Kinetics, Equilibrium, Acids and Bases, Thermodynamics, Electrochemistry and Coordination compounds. Appropriate lab experiments are included. **This course is primarily for pre-professional science and engineering majors.**

<b>Course Title</b>	<b>General Chemistry II</b>
<b>Course Number</b>	<b>CHEM 1412</b>
<b>Credit Hours</b>	<b>4 semester hours</b>
<b>Prerequisites</b>	<b>CHEM 1411 or equivalent and MATH 1314 or equivalent with grades of "C" or better</b>
<b>Class Days and Times</b>	<b>See Semester Schedule Catalog</b>
<b>Class Room</b>	<b>W-132</b>
<b>Laboratory Location</b>	<b>W-212 ( Chem. Lab )</b>
<b>Instructor</b>	<b>Dr. J. Pelezo</b>
<b>Office</b>	<b>W-224-A</b>
<b>Office Hours</b>	<b>TBA &amp; Posted on Office Door</b>
<b>E-mail</b>	<b><a href="mailto:jpelezo@lonestar.edu">jpelezo@lonestar.edu</a> or <a href="mailto:drpelezo@gmail.com">drpelezo@gmail.com</a> (&lt;= Preferred)</b>
<b>Office Phone</b>	<b>281/351-3306</b>

**ADA STATEMENT:**

"The Americans with Disabilities Act (ADA) of 1990 is a federal anti -discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodations of their disabilities. If you believe you have a disability requiring an accommodation, please contact the instructor at the beginning of the semester so that accommodations may be made in a timely fashion.

**SOFTWARE Piracy :**

"Students are strictly prohibited, by law, from unauthorized copying of software which has been purchased by Tomball College for use in the laboratories. The Natural Sciences and Mathematics Division and Tomball College will abide by these copyright laws. Furthermore, we will take appropriate disciplinary action against violators of these laws.

**LEARNING OUTCOMES:**

- Apply the principles of chemical equilibrium and predict response of the chemical system qualitatively and quantitatively.
- Describe the solution process including intermolecular forces and properties of the resulting solutions
- Determine acidity or basicity of a solution and perform pH calculations .
- Predict outcome of mixing acids and bases.
- Balance equations involving electron transfer and apply the concept to electrochemical cells.
- Define free energy and its relationship to enthalpy and entropy and apply the concept to predict spontaneity of chemical reactions.
- Find rate law and calculate rate, rate constant and activation energy from experimental data.
- Explain relationship between collision theory and rate of a chemical reaction.
- Demonstrate ability to accurately read and record data from laboratory measurements, perform calculations on data and report results with correct significant figures.
- Solve standard problems by applying basic principles and novel problems by extrapolations from basic principles.

## **SPECIFIC LEARNING OBJECTIVES:**

- Lecture

- 1) Read the assigned material before it is covered in class so that you are generally familiar with the ideas as the instructor discusses them.
- 2) Take careful class notes on what is said and written on the board.
- 3) At the first opportunity, read your class notes over and be sure that you know how to solve the illustrative examples that your instructor solved in class without looking at the solutions in your notes. Be able to state all laws, principles and theories and to explain experimental observations or facts by laws, theories or principles.
- 4) Read the assigned material again and review the "key terms" in bold type which are defined in the glossary to be sure that you know the exact meaning of each.
- 5) Do the assigned exercises at the end of the chapter to develop problem-solving skills. Answers to part of these problems are in the back of the book. Detailed solutions to all of them are given in the solutions manual.
- 6) Course content will include:
  - Two major exams, ten 5-question quizzes, laboratory exercises and a final exam will be given to evaluate your progress.
  - Exams and quizzes include 3 main parts:
    - Definitions, laws, theories and principles
    - Apply laws, theories and principles to explain experimental observations or facts.
    - Chemical calculations.

- Laboratory

- a) Lab safety will be practiced in this class. Plastic safety glasses or goggles must be worn at all times in the lab. Be aware of hazardous chemicals which may be flammable, toxic or very reactive. The lab exercise includes warnings about these chemicals. The instructor will emphasize the special handling of these chemicals at the beginning of lab session. Additionally, a list of hazardous chemicals will be posted on the bulletin board in each lab room for student use.
- b) Prelab assignments (if assigned) should be turned in at the beginning of the lab session.
- c) Assigned experiments should be carefully and accurately performed following the lab manual instructions. Any deviations from these procedures will be announced by the instructor at the beginning of the lab period.
- d) Laboratory work is a mandatory component of the Chemistry 1411 course. Students must complete assigned activities in order to earn credit for this course.
- e) Laboratory activities will be written-up in laboratory records notebook according to the following format:
  - Title
  - Purpose - primary objective of experiment
  - Discussion - theoretical background relating to subject being studied
  - Procedure - itemized listing of methods and techniques
  - Data & Calculations
  - Graphic Analysis
  - Discussion of Results - scientific principles examined, used and/or supported
  - Conclusions - itemization of objective results.
- f) All materials to be turned in should be legible and have correct spelling, grammar and punctuation. Notebooks will be graded according to neatness, completeness, accuracy and application of the scientific method.

## REQUIRED MATERIALS:

### Computer Access:

=> Class Website (<http://www.chemunlimited.com>)

=> Virtual Lab Subscription (<http://www.modelscience.com/>) => Basic program: Chem Lab Standard (\$33.99).

### Materials:

- a.) Instructional Package consisting of:
  1. Textbook: General Chemistry, 10<sup>th</sup> edition; by Ebbing.
- b.) Optional Study Aids:
  1. Study Guide for General Chemistry, by Senyk, Krannich, and Braun
  2. Complete Solutions Manual ; by George Schenk
- c.) Laboratory Records Notebook & 3-Ring Loose Leaf Binder for lab pack.  
=> Virtual Lab Subscription (<http://www.modelscience.com/>) => Basic program: Chem Lab Standard (\$33.99).
- e.) Calculator: Should have square root, log, antilog,  $y^x$  and exponent (EXP or EE) functions.
- f.) Safety glasses or goggles: Safety glasses will be provided in lab. However, if you wish to purchase your own glasses, that's acceptable. Students working in the laboratory must have safety glasses on at all times. Personal eye glasses are acceptable as laboratory safety glasses (NO SUNGLASSES!)

## OPTIONAL MATERIALS OR REFERENCE TEXTS:

VanDerWerf, Acid Base Chemistry of the Covalent Bond, free download from homepage of class website.

=>

<http://chemunlimited.com/Vanderwerf%20%20Acids,%20Bases%20and%20The%20Chemistry%20of%20The%20Covalent%20Bond004.pdf>

## EVALUATIONS AND GRADING:

Final class average for Summer terms will be based upon 2 major exams, Highest 10 out of 18 - 20 5-question quizzes, a laboratory grade and a final exam will determine final grade. Each score will be given equal weight when computing your final grade; i. e., 20% each.

A = $\geq$ 90%	1) Quiz average (Highest 10 of 18 – 20 quizzes)
B = 80 - 89%	2) Exam 1 grade (50 question multiple choice)
C = 70 - 79%	3) Exam 2 grade (50 question multiple choice)
D = 60 - 69%	4) Laboratory grade
F = $\leq$ 59%	5) Final exam grade (50 question multiple choice)

**\*\*\* Average of these five (5) grades is the final grade for the course.**

Exams will be multiple choice. All exams will be comprehensive with concentration on current designated material. Daily tests and/or homework will be assigned and graded at the discretion of the instructor. Any extra graded assignments will be averaged into your quiz grade.

## ABSENCES AND MAKE-UPS:

- A. **Lecture:** While attendance does not count for a percentage of your grade, it is strongly recommended if you wish to pass the course. If you miss a class, get the notes from another student.
- B. **Exams:** No make-ups on tests, quizzes or final exam. However, if a major exam is missed for good reason, the value of the final exam will be counted as the missed exam. A second missed exam will be entered as a zero - that is, the final exam will not be used to sub. for a second missed exam...it will only be used once and the Final Exam will **not** be dropped.

### Exam Coverage (Comprehensive)

- Exam I => Ch 12 - 14
  - Ch 12: Solutions and Solution Phase Rxns
  - Ch 13 Kinetics
  - Ch 14 Equilibrium
- Exam II => Ch 12 - 17
  - Exam I topics
  - Ch 15 Acid/Base Theories
  - Ch 16 Weak Acid/Base Equilibrium
  - Ch 17 Solubility Product Equilibrium
- Final Exam => Ch 18 - 20
  - Exams I & II topics
  - Ch 18 Thermodynamics
  - Ch 19 Electrochemistry
  - Ch 20 Nuclear Chemistry

**ALSO NOTE:** If exam is missed, the final exam will NOT be a substitutionary grade for a low score on exams 1 or 2. The final exam will only count extra for an exam missed due to good reason.

- C. **Labs:** Attendance is mandatory. One lab make-up is allowed at non-scheduled times during the week that lab is performed (see instructor for arrangement).

## GUARANTEED GRADUATE:

NHMCCD guarantees that graduates of its Associates of Arts, Associates of Science, and Associate of Applied Science and Certificate programs, providing under certain circumstances, additional education and training tuition free to students lacking appropriate mastery of specified competencies.

## COMPUTER VIRUS PROTECTION:

Computer viruses are, unfortunately, a fact of life. Using the diskettes on more than one computer creates the possibility of infecting computers and diskettes with a virus. This exposes the computers of the college, your personal computer, and any others you may be using to potentially damaging viruses. Tomball College has anti-virus procedures in place to protect all computers under your control and use and ensure that each diskette you use has been scanned with anti-virus software prior to using Tomball College computer.

**SPECIAL NEEDS STUDENTS**

Students with special needs should contact the instructor at the beginning of the semester

**WITHDRAWAL POLICY:**

Withdrawal from class is the responsibility of the student and must be done by "W-day". (See catalog for date or check with Registrar's Office).

**EQUAL OPPORTUNITY STATEMENT:**

It is the policy of the North Harris Montgomery Community College District to provide equal employment, admission and educational opportunities without regard to race, color, or disability. Any form of harassment will not be tolerated.