TEXT AND OTHER MATERIALS:

Stephen F. Austin State University, CHEM 1105 Online Lab Manual, 1st Edition, 2021

This lab course requires buying the online lab manual as well as VCL access. See the Table below. In D2L under ‘Content’ there is the folder “.

You need:
-A scientific calculator, pencil, eraser.

Course Description: Introductory laboratory experiments.
Number of Credit Hours: 1 credit hour – 2 labs per week
Course Prerequisites and Co-requisites: Co-requisite: CHE 111. Instead of Lab fee, you have to buy access to labster.com
Program Learning Outcomes: This course is a general education core curriculum course and a service course.

Course Objective: To provide students with an explanation of the basic principles of chemistry as illustrated through laboratory simulations and to apply these principles to respond to the quizzes in labster involving critical thinking.

Student Learning Outcomes: The student is expected to recognize and apply the following concepts to problem solving in a laboratory setting.
- Units of measure and significant figures, unit conversion, density and definitions of matter.
- Basics of atomic theory applied to the atom, basics of the periodic table, correct use of terms.
- Writing correct formulas of compounds and inorganic nomenclature as well as Lewis structure and VSEPR theory.
- Determination of mass calculations in chemical formulas and chemical reactions, writing balanced chemical reactions
- Principles of acid/base theories, pH, buffers, acid-base indicators, and titration

Table below provide the weekly assignments and deadlines.
## Tentative Class Calendar Summer II 2021

**Dr. Bidisha Sengupta**

*(All the due date times on the timeline are based on Central Standard Time)*

<table>
<thead>
<tr>
<th>Week start Date</th>
<th>Week End Date</th>
<th>Topics/Content</th>
<th>Activities &amp; Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 28</td>
<td>July 4</td>
<td>Safety and an Introduction to Chemistry lab pg 2 Significant Figures—pg 5</td>
<td>All quizzes and exams are in D2L. All assignments are due on Sunday 11:30 PM 2 Pre lab quizzes Post lab sub</td>
</tr>
<tr>
<td>July 5</td>
<td>July 11</td>
<td>VCL 3-1 and 3-10 ... pg 8 VCL 3-3 and 3-7 ... pg 10</td>
<td>2 Pre lab quizzes Post lab quiz</td>
</tr>
<tr>
<td>July 12</td>
<td>July 18</td>
<td>VCL 2-7 and 2-9 ... pg 13 VCL 2-4 ...pg 14</td>
<td>2 Pre lab quizzes Post lab quiz</td>
</tr>
<tr>
<td>July 19</td>
<td>July 25</td>
<td>VCL 1-8 ... pg 17 PhET Lab ... pg 18</td>
<td>2 Pre lab quizzes Post lab quiz Midterm (on week 1-3 labs)</td>
</tr>
<tr>
<td>July 26</td>
<td>August 1</td>
<td>VCL 2-13 Molarity, VCL 6-15 Acid Base Standardization ... pg .....20 VCL 5-1 Boyle’s, VCL 5-2 Charles’ Law, and VCL 5-3 Avogadro’s Law ... pg ......22</td>
<td>2 Pre lab quizzes Post lab quiz</td>
</tr>
</tbody>
</table>
Week 6  
August 2  
Hands-On Activity for the Ideal Gas Law … pg 25  
2 Pre lab quizzes  
Post lab quiz  
Final on D2L 8/06 deadline 11:30 PM

General Education Core Curriculum
- This course has been selected to be part of Stephen F. Austin State University’s core curriculum. The Texas Higher Education Coordinating Board has identified six objectives for all core courses: Critical Thinking Skills, Communication Skills, Empirical and Quantitative Skills, Teamwork, Personal Responsibility, and Social Responsibility. SFA is committed to the improvement of its general education core curriculum by regular assessment of student performance on these six objectives.

- Introductory Chemistry Lab is a general education core curriculum course and fulfills the teamwork general education core curriculum requirement. Another, “shell” course has been created to collect student artifacts to meet this state requirement. You will see this course on your D2L list.

- During this semester, you will receive an assignment that fulfills both the requirements of this course and the needs of Stephen F. Austin State University’s Core Curriculum Assessment Plan with the Texas Higher Education Coordinating Board.

<table>
<thead>
<tr>
<th>Core Objective</th>
<th>Definition</th>
<th>Course Assignment Title</th>
<th>Date Due in D2L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teamwork</td>
<td>To include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal.</td>
<td>Team work rubrics</td>
<td>Tuesday, June 28 is beginning of lab in D2L.</td>
</tr>
</tbody>
</table>

COURSE REQUIREMENTS AND DESCRIPTION:
The course evaluation consists of weekly lab simulations, quizzes for each lab in labster, quiz each week, and a final exam. The quizzes will cover materials from that week’s lab simulations.

METHOD OF EVALUATION:
The grade is a percent of a total point composed of labs, Pre-labs/quizzes and two exams. The grade composition is as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 Pre Lab quizzes, 10 points each, lowest 2 dropped</td>
<td>100 points</td>
</tr>
<tr>
<td>Postlab dropbox, 5 points each</td>
<td>60 points</td>
</tr>
<tr>
<td>Midterm in D2L</td>
<td>50 points</td>
</tr>
<tr>
<td>Final Exam in D2L</td>
<td>50 points</td>
</tr>
<tr>
<td>TOTAL</td>
<td>260 points</td>
</tr>
</tbody>
</table>

Grading scale as a % - A = 100 – 90, B = 89 – 80, C = 79 – 70; D = 69 – 60; F = 59 and below

[A ≥ 234; B ≥ 208-233; C≥ 182-207; D ≥ 156-181; F< 156]
Online Lab: Exploration, and evaluation questions (100 points)

- Each week there are 2 lab simulations. Each week there will a quiz on that week’s labs (prelab and postlab writeup).
  - Any assignment turned in late by 1 day (calendar date) will lose 30%, 2 day (calendar date) will lose 60%, 3 or more day late will earn ‘0’.

Final Exams (100 points):

- Final Exam will be given in D2L in the 6th week on all the 11 lab simulations.

ACADEMIC HONESTY POLICY (A-9.1):
Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism.

STUDENTS WITH DISABILITIES:
To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to http://www.sfasu.edu/disabilityservices/.

General Education Core Curriculum

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- Assessment of these objectives at SFA will be based on student work from all core curriculum courses. This student work will be collected in D2L. The chart below indicates the core objectives addressed by this course, the assignment(s) that will be used to assess the objectives in this course and uploaded this semester.

<table>
<thead>
<tr>
<th>Core Objective</th>
<th>Definition</th>
<th>Course Assignment Title</th>
<th>Date Due in Dropbox</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teamwork</td>
<td>To include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal.</td>
<td>Teamwork rubrics</td>
<td></td>
</tr>
</tbody>
</table>
Core Objective 1: Critical Thinking: to include creative thinking, innovation, inquiry and analysis, evaluation and synthesis of information.


Critical thinking involves the use of a group of interconnected skills. The skills needed can be broken down into six steps.

Six Steps of CRITICAL THINKING

1. Knowledge means a student must have basic knowledge about the subject.

2. Comprehension requires understanding of the subject. Students that comprehend the new knowledge are able to relate the new knowledge to what they already know. Comprehending goes beyond simply parroting material back.

3. Application requires both knowledge and comprehension. Students must be able to carry out a task or apply their knowledge and comprehension to an assigned task.

4. Analysis involves breaking the knowledge down into smaller parts so it become clear how the smaller parts are related to other ideas.

5. Synthesis involves the ability to put together the parts you analyzed with other information to create something original

6. Evaluation occurs once we have understood and analyzed what is said or written and the reasons offered to support it. Then we can appraise this information in order to decide whether you can give or withhold belief, and whether or not to take a particular action.

Adapted from: http://www.mhhe.com/socsicence/philosophy/reichenbach/m1_chap02studyguide.html; (accessed May 23, 2013)

Core Objective 2: Communication Skills: to include effective development, interpretation and expression of ideas through written, oral, and visual communication.

COMMUNICATION SKILLS in the sciences

For an excellent resource in scientific communication from a highly reputable source see the information provided on the Nature website link shown below.

http://www.nature.com/scitable/topic/scientific-communication-14121566; (accessed May 31, 2013)
Three especially informative links within the link shown above are:

- Effective Communication
- Effective Writing
- Audience/Purpose

Scientific communication traditionally includes writing in third person, past tense, passive voice. In formal, scientific writing slang terms and contractions are avoided.

**Core Object 3: Empirical and Quantitative Skills: to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions.**

**EMPIRICAL AND QUANTITATIVE SKILLS**

Chemists rely on observations to explain the nature of the substances they study. There are two types of observations exist: qualitative and quantitative. A **qualitative observation** is an observation made with the senses and is usually expressed using words instead of numbers. Qualitative observations about a person sick in the hospital might include that the person is breathing rapidly, has a high temperature, and is very thin.

A **quantitative observation** is an observation that requires a numerical measurement and describes something in terms of "how much". The quantitative observation that a person has a temperature of 103.6 °F is much more useful information than just knowing that the person has a fever. Quantitative observations are preferred by scientists. Often quantitative data is acquired in lab.

One or more measurement is always a part of any quantitative observation. A **measurement** determines the dimensions, capacity, quantity, or extent of something. The most common types of measurements made in chemical laboratories are those of mass, volume, length, temperature, pressure, and concentration. Measurements always consist of two parts: a **number**, which tells the amount of the quantity measured, and a **unit**, which tells the nature or kind of quantity measured. A measured number without a unit is meaningless.

Once quantitative data is obtained, chemists then mathematically manipulate and analyze data. Adapted from saplinglearning.com; accessed May 31, 2013

**Core Objective 4: Teamwork: to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal.**

Definition of **TEAMWORK**: work done by several associates with each doing a part but all subordinating personal prominence to the efficiency of the whole.


**TEAMWORK General Rules**

Each team member needs:

- all ideas evaluated critically;
- treat others in the group with respect
- everyone needs to pull their weight, meet deadlines, and contribute equally;
- actions need to be followed through;
• reporting needs to be accurate and comprehensive;
• problems with under-performing team members need to be discussed openly and resolved quickly; and
• peer assessment should be given fairly

Every laboratory activity meets all 4 Core Objectives:

| Core Objective 1: Critical Thinking Skills | Every lab will require a collection of data in which you must analyze the information. Each lab has objectives that are achieved by manipulating chemicals and equipment which involves inquiry skills. |
| Core Objective 2: Communication Skills | Communication with your lab partner is absolutely essential in order to perform the experiment, take data, and analyze the results. |
| Core Objective 3: Empirical and Quantitative Skills | Each lab will include the manipulation and analysis of numerical data or observable facts from which an informed conclusion will be drawn. |
| Core Objective 4: Teamwork | When working with a partner in a lab setting, it is important to work as a team, considering different points of view and working effectively to meet the objectives set forth in the lab manual. This Core Objective is Strongly Emphasized in Lab. |

Note: This syllabus is subject to change at the Instructor’s discretion.
Dr. Bidisha Sengupta
June 14, 2021