Introductory Chemistry Laboratory
CHE 1105L Sections: 029, 030, & 031 (Previous Course # 111L)
Time of Meeting: T 3:30– 5:20pm
Semester: Fall 2020
(Students must be enrolled in CHE 111 Lecture)

<table>
<thead>
<tr>
<th>Name</th>
<th>Department</th>
<th>Email</th>
<th>Phone</th>
<th>Office</th>
<th>Office Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Chemistry and Biochemistry</td>
<td><a href="mailto:onchokekk@sfasu.edu">onchokekk@sfasu.edu</a></td>
<td>936-468-2386</td>
<td>Math 118</td>
<td>M 12-1, 4 -5; W 12 -1; R 2 -3, 4-5 F 9 -9.50; and by appointment</td>
</tr>
</tbody>
</table>

**Course Description:** Introductory laboratory experiments.

This lab course is for 1 credit and typically meets for 345 minutes a week for 15 weeks plus meets for a 2-hr midterm and 2-hour final examination. Students have significant daily reading to prepare for lab each day and lab reports involving critical thinking and quantitative reasoning. Students are tested over the material via quizzes and a comprehensive final exam. Students are expected to prepare prior to each lab (literature and concepts), attend lab hours (conduct experiments via Zoom Online Labster Software), and report results (lab reports). Students have required academic components and deliverables: written work (daily notebook, pre-lab assessments, and lab reports). These activities, inclusive of the lab expectations and academic components, average a minimum of 2 hours of work each week.

**Number of Credit Hours:** 1 semester hour. The grade is separate from the lecture grade.

**Course Prerequisites and Co-requisites:** Co-requisite: CHE 111. Lab fee required.

**Course Objective:** To provide students with an explanation of the basic principles of chemistry as illustrated through laboratory experiments and to apply these principles to laboratory work involving critical thinking.

**Class location:**

<table>
<thead>
<tr>
<th>Lab section</th>
<th>pre-lab lecture location</th>
<th>lab location</th>
</tr>
</thead>
<tbody>
<tr>
<td>029</td>
<td>Labster website</td>
<td>Labster website (Labster.com)</td>
</tr>
<tr>
<td>030</td>
<td>Labster website</td>
<td>Labster website (Labster.com)</td>
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<tr>
<td>031</td>
<td>Labster website</td>
<td>Labster website (Labster.com)</td>
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</table>

**Text and Materials:** Labster labs with due dates per the syllabus. Students will be expected to register to labster and pay for the labs. You will purchase p access to Labster by using a Credit or Debit card. A non-programmable, scientific calculator is required for all exams and quizzes. Communication for lab will be sent through SFA email.

**Useful resources and questions:**


It is recommended that students go through the Brightspce by D2L to access the labs.
Laboratories: Students taking the laboratory are directed to purchase the virtual laboratory software listed below. Students are to order the laboratory components directly from Labster Software. Students can access the lab simulations after purchase.

COURSE CALENDAR: ON SEPARATE PAGE

GRADING POLICY: The point total for the requirements shown in the Course Requirements is 1300. Grades are based on the total number of points earned out of 1300.

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

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
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</thead>
<tbody>
<tr>
<td>10 Labs</td>
<td>1000</td>
</tr>
<tr>
<td>10 Quizzes</td>
<td>100</td>
</tr>
<tr>
<td>Exams (1 Midterm &amp; 1 Final Exam)</td>
<td>200</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1300</td>
</tr>
</tbody>
</table>

Grading scale as a %: A= 100 – 90, B= 89 – 80, C= 79 – 70; D= 69 – 60; F= 59 and below
Grading scale as Total points: [A ≥ 900; B ≥1040; C ≥ 910; D ≥ 780; F< 780]

Laboratory quizzes
Quizzes will be given on the dates shown in the laboratory calendar. The quizzes will be done in D2L. The lowest quiz grade will be dropped. The 10 best quiz grades will be kept. Each laboratory quiz is worth 10 points. A total of 100 points from laboratory quizzes is possible. The laboratory quiz will be given in D2L restricted times. Quizzes are to be done within specified times in D2L. QUIZ done outside the deadlines will receive no credit.

Laboratory experiments
Eleven laboratory experiments will be done. Each lab is worth 100 points. The lowest experiment will be dropped, and the best 10 experimental grades will be kept. A total of 1000 points from experiments is possible. The experiments will be submitted in at the end of the laboratory period, unless otherwise stated by the instructor. Any assignment submitted after the announced time will not receive any credit.

Midterm and Final Exam:

- A midterm exam will be given during the laboratory period. It will cover material from the safety video and rules, and labs #1 - #6.
- The final exam will be given during the laboratory period. It will cover material from Labs #7 - 11
- The midterm and the final are worth 100 points each.

Make-up Policy: NO make-up labs or quizzes will be given since the lowest quiz grade and the lowest experiment grade will be dropped.

ATTENDANCE POLICY:
Attendance of class is mandatory. Three (3) or more absences will result in an ‘F’ for the course. Absences may be assigned to anyone that disrupts class, sleeps in class, or consistently comes in late or leaves early.

ACADEMIC INTEGRITY (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.

Definition of Academic Dishonesty: Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not limited to (1) using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class; (2) the falsification or invention of any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they were your
own. Examples of plagiarism are (1) submitting an assignment as if it were one's own work when, in fact, it is at least partly the work of another; (2) submitting a work that has been purchased or otherwise obtained from an Internet source or another source; and (3) incorporating the words or ideas of an author into one's paper without giving the author due credit.

Please read the complete policy at http://www.sfasu.edu/policies/4.1-student-academic-dishonesty.pdf
Any student found cheating will be subject to the penalties as stated in the Student Code of Conduct handbook; including but not limited to a score of zero on exam, expulsion from the class or expulsion from the University.

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/.

CLASSROOM BEHAVIOR POLICY:
Acceptable Student Behavior: Classroom behavior should not interfere with the instructor’s ability to conduct the class or the ability of other students to learn from the instructional program (see the Student Conduct Code, policy D-34.1). Unacceptable or disruptive behavior will not be tolerated. Students who disrupt the learning environment may be asked to leave class and may be subject to judicial, academic or other penalties. This prohibition applies to all instructional forums, including electronic, classroom, labs, discussion groups, field trips, etc. The instructor shall have full discretion over what behavior is appropriate/inappropriate in the classroom. Students who do not attend class regularly or who perform poorly on class projects/exams may be referred to the Early Alert Program. This program provides students with recommendations for resources or other assistance that is available to help SFA students succeed.
Please review the entire code of conduct here: http://www.sfasu.edu/policies/student-code-of-conduct-10.4.pdf

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.

• 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>
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</tbody>
</table>

Core Objective 1: Critical Thinking: to include creative thinking, innovation, inquiry and analysis, evaluation and synthesis of information.
Definition of **CRITICAL THINKING**: disciplined thinking that is clear, rational, open-minded, and informed by evidence. [http://dictionary.reference.com/browse/critical+thinking](http://dictionary.reference.com/browse/critical+thinking); *accessed May 23, 2013*

**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](http://www.mhhe.com/socsicence/philosophy/reichenbach/m1_chap02studyguide.html) *accessed May 23, 2013*

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**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](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.

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**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

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**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.

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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:

<p>| 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. |</p>
<table>
<thead>
<tr>
<th>Date</th>
<th>Lab Exercise/Assignment/Activity</th>
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</table>
| August 25    | Go over the Syllabus  
What to do before lab on August 25.  
Read carefully watch safety rules.  
Watch the following Safety Video and take notes.  
Study for the Lab Safety Lab –Pennies on pages 6 to 13 of Lab Manual  
The link to the safety video is : https://www.youtube.com/watch?v=0zHev9iM8kU  

**Lab #1: Safety Video and take notes.**  
**Quiz1 – ACS Safety Video (Quiz on Sept. 1, 2020)**  
**Instruction:** Safety Video and calculations.  
**Assignment:**  
1) Checking attendance  
2) Complete safety and registration to Labster website laboratory and perform all calculations  
3) Evaluate data, discuss findings, and provide a written summary and conclusion of your results.  
4) Be prepared to do the Safety Quiz Via D2L by Tuesday lab on Sept. 1, 2020. |
| Sept. 1 (Tue)| **#2 Lab Safety Lab from Labster.**  
**Familiarize yourself with Labster before doing this lab.**  
**Instruction:**  
1) Log in to the Labster and do the assignment therein.  
2) Discuss findings and write as summary and conclusions  
   Answer Questions in Labster per directions in Labster.  

**Quiz 2 – Lab Safety Lab from Labster. Labster Safety quiz will be given in D2L**  
**Instruction:** Safety  
**Assignment:**  
1) Complete safety laboratory and perform all calculations  
2) Answer Questions in Labster.  
3) Evaluate safety precautions, discuss findings, and provide a written summary and conclusion of your results.  
4) Labster Safety quiz will be given in D2L |
| Sept. 8 (Tuesday)| **#3: Matter and Phase Changes (From Labster)**  
**Instruction:** Review of chemical concepts needed for matter (solid, liquid and gases)  
Work through the experiment in Labster  
1) Students turn in the quizzes in Labster.  

**Quiz #3 will be done in D2L. covering information on Matter and phase changes.** |
| September 15 (Tue)| **#4: Periodic Table Trends (Principles)**  
**Instruction:**  
1) Complete assignment in Labster  
2) Understand the Periodic table Trends  

**Quiz #4 will be given in Labster.** |
| Sept. 22 (Tue)| **Lab #5: Atomic Structure (Principles): Bohr and Quantum models**  
**Quiz #5 will be given in Labster.** |
| Sept. 29 (Tue)| **Lab #6: Ionic and Covalent Bonds**  
**Instruction:** How to recognize ionic and Covalent Compounds.  
**Assignment:**  
(a) Complete Ionic and Covalent Bonds Lab  
(b) Discuss results within Labster.  
(c) Submit your report in Labster.  

**Quiz #6 will be given in Labster** |
<p>| Oct. 6 | <strong>Midterm Exam – covers everything through Sept. 29</strong> |</p>
<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
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</thead>
<tbody>
<tr>
<td>Oct. 13</td>
<td>Lab 7 - Balance equations lab. Quiz 7 will be given in D2L.</td>
</tr>
<tr>
<td>Oct. 20</td>
<td>Lab 8 - Stoichiometric calculations: Identify an unknown compound using gravimetric analysis. Quiz 8 – will be given in D2L.</td>
</tr>
<tr>
<td>Oct. 27</td>
<td>Lab #9: Introduction to Titration Lecture (Instructor will Lecture on the Lab) Via Zoom A Zoom ID and password will be provided. Instruction: Titration Labs - Review of chemical concepts needed for titration - Explain the purpose of each of the 3 titration labs students will perform. - Demonstrate how to perform titrations - Give sample data and calculations Quiz 9: Quiz 9 will be given in D2L. Q9 will test your understanding of the principles of titration covered in class over Titration.</td>
</tr>
<tr>
<td>Nov. 3</td>
<td>Lab #10: Acids and Bases (Principles) Lab from Labster (a) Learn basic principles of acids and bases Answer Questions about Labster within the Labster environment Quiz 10 - On acids and bases will be given in D2L.</td>
</tr>
<tr>
<td>Nov. 10</td>
<td>#11: Titration (From Labster) Assignment: 1) Perform titration as per directions in Labster. 2) Perform titration simulation 3) Analyze data and provide conclusions. 4) Submit/Answer questions within Labster and complete the Laboratory experiment in Labster. Quiz 11 – covers information/calculations and information from Titration in Labster. Quiz is launched in D2L.</td>
</tr>
<tr>
<td>Nov. 17</td>
<td>Laboratory Final – covers Acids and Bases, titration labs.</td>
</tr>
<tr>
<td>Nov. 21-</td>
<td>THANKSGIVING HOLIDAYS – NO LAB.</td>
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<tr>
<td>Nov. 30</td>
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</tbody>
</table>

List of Labster Labs

<table>
<thead>
<tr>
<th>Labs</th>
<th>Date when Done</th>
<th>Quiz Due dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introductory Lab (ACS Safety Video)</td>
<td>August 25</td>
<td>Sept. 1, 2020</td>
</tr>
<tr>
<td>Lab Safety</td>
<td>Sept. 1</td>
<td>September 2</td>
</tr>
<tr>
<td>Matter and Phase Changes</td>
<td>Sept. 8</td>
<td>September 9</td>
</tr>
<tr>
<td>Periodic Table Trends (Principles)</td>
<td>September 15</td>
<td>September 16</td>
</tr>
<tr>
<td>Atomic Structure (Principles) Bohr and Quantum models and Isotopes Periodic Table (Principles)</td>
<td>September 22</td>
<td>September 23</td>
</tr>
<tr>
<td>Ionic and Covalent Bonds</td>
<td>Sept. 29</td>
<td>September 30</td>
</tr>
<tr>
<td>MIDTERM</td>
<td>Oct 6</td>
<td></td>
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<tr>
<td>Stoichiometric Calculations</td>
<td>Oct. 20</td>
<td>Oct. 21</td>
</tr>
<tr>
<td>Introduction to Titration Lecture (Instructor will Lecture on the Lab)</td>
<td>Oct. 27 – A dry Lab</td>
<td>Lecture Via Zoom Quiz due on Oct. 21</td>
</tr>
<tr>
<td>Acids and Bases (Principles) Lab</td>
<td>Nov. 3</td>
<td>Nov. 4</td>
</tr>
<tr>
<td>Titration (From Labster)</td>
<td>Nov. 10</td>
<td>Nov. Nov. 11</td>
</tr>
<tr>
<td>Final Exam</td>
<td>Nov. 17</td>
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