Course Description: Introductory laboratory experiments.

Number of Credit Hours: 1 semester hour – 2 hours lab per week

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 & time:

<table>
<thead>
<tr>
<th>lab section</th>
<th>pre-lab lecture location</th>
<th>lab location</th>
<th>lab time</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>C-106</td>
<td>C-101</td>
<td>4:00-5:50 M</td>
</tr>
<tr>
<td>24</td>
<td>C-106</td>
<td>C-105</td>
<td>4:00-5:50 M</td>
</tr>
<tr>
<td>25</td>
<td>C-106</td>
<td>C-102</td>
<td>4:00-5:50 M</td>
</tr>
</tbody>
</table>

Text and Materials: Introductory Chemistry Lab (CHE 111 L) Laboratory Manual 17th ed. for Fall 2018, Spring 2019, & Summer 2019. This manual is available at local bookstores. A non-programmable, scientific calculator is required for all exams and quizzes. Communication for lab will be sent through D2L.

COURSE CALENDAR: ON SEPARATE PAGE

GRADING POLICY: The point total for the requirements shown in the Course Requirements is 500. Grades are based on the total number of points earned out of 500.

The grading scale for the lab is:

A ≥ 450;  B ≥ 400;  C ≥ 350;  D ≥ 300;  F ≤ 299

Laboratory quizzes

Quizzes will be given on the dates shown in the laboratory calendar. The lowest quiz grade will be dropped. The 7 best quiz grades will be kept. Each laboratory quiz is worth 20 points. A total of 140 points from laboratory quizzes is possible. The laboratory quiz will be given at the beginning of lab. STUDENTS WHO COME IN LATE AND MISS THE QUIZ WILL NOT BE ALLOWED TO TAKE THE QUIZ.
Eight laboratory experiments will be done. Each report sheet for the experiment is worth 20 points. The lowest experiment/assignment will be dropped, and the best 7 experimental grades will be kept. A total of 140 points from experiments is possible. The report sheets will be turned in at the end of the laboratory period, unless otherwise stated by the instructor. Any assignment turned in after the announced time will have 10% deducted per day beginning with the first day.

Two assignments will be required.
Assignment 1 (20 pt): write a summary of the titration of antacid lab and prepare graphs using Excel.
Assignment 2 (10 pt): complete Teamwork Core Assessment Rubrics for all group members for titration labs.

Midterm and Final Exam:
- A midterm exam will be given Oct. 15 during the laboratory period. It will cover material from the safety video and rules, and labs #1 -#4.
- The final exam will be given Dec. 03 during the laboratory period. It will cover material from Labs #5-8
- The midterm and the final are worth 95 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/academic_integrity.asp. 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.

- Come to lab prepared (spend at least ONE HOUR reading over entire lab before lab period AND reviewing the previous week’s lab) and on time.
- Bring a NON-programmable, scientific calculator. Cell phones and programmable calculators may NOT be used on quizzes.
- Turn off and put away cell phones; NO texting during lab.
- Come dressed as described in the safety rules that will be given: (Clothes to the ankles, no mid-drift shirts, closed-toe shoes. Shoes MUST completely cover feet. Anyone not dressed appropriately for lab will be sent home.)
- Follow all safety rules and good laboratory practices at all time:
- Wear safety glasses/goggles when anyone in the lab is working on an experiment.
- One warning concerning safety glasses/goggles will be given. A person will be sent home for a second offense and be will earn a zero that may NOT be dropped.
- NO horseplay in laboratory
- Be courteous and respectful of other students, laboratory assistants, and stockroom personnel.
- Learn your section number and your laboratory assistant's name.
- Work with assigned lab partner unless otherwise instructed by the lab assistant.
- Students are responsible for any answer they report on a lab, assignment, or quiz. Laboratory teaching assistants are students and sometimes may make an error or misunderstand a question. You can NOT claim the lab assistant told you the wrong answer and get points back.
- Significant figures are required on all answers given in lab on laboratory report sheets, assignments, quizzes, and exams.
- No make up quizzes will be given if a student comes in late and misses the quiz.
- Missing a pre-lab lecture will result in a 10% deduction from the lab for and a zero will be recorded for the quiz. Absences may be assigned to anyone that disrupts class, sleeps in class, or consistently comes in late or leaves early. Any assigned absence will result in a zero for the day which can NOT be dropped.

POINTS WILL BE DEDUCTED FROM YOUR GRADE FOR NOT FOLLOWING THE COURSE REQUIREMENTS OR THE LABORATORY BEHAVIOR POLICY

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 through LiveText. LiveText accounts will be provided to all students enrolled in core courses through the university technology fee. You will be required to register your LiveText account, and you will be notified how to register your account through your SFA e-mail account. If you forward your SFA e-mail to another account and do not receive an e-mail concerning LiveText registration, please be sure
to check your junk mail folder and your spam filter for these e-mails. If you have questions about LiveText call Ext. 1267 or e-mail SFALiveText@sfasu.edu.

- 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 to LiveText this semester, and the date the assignment(s) should be uploaded to LiveText. Not every assignment will be collected for assessment every semester. Your instructor will notify you which assignment(s) must be submitted for assessment in LiveText this semester.

<table>
<thead>
<tr>
<th>Core Objective</th>
<th>Definition</th>
<th>Course Assignment Title</th>
<th>Date Due in LiveText</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO 1 - Critical Thinking Skills</td>
<td>To include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information.</td>
<td>Skills developed in this course: solving questions pertaining to equilibrium constants ($K_c$, $K_p$, $K_{sp}$, $K_a$, $K_b$)</td>
<td>Not assessed in this course</td>
</tr>
<tr>
<td>CO 2 - Communication Skills</td>
<td>To include effective development, interpretation and expression of ideas though written, oral, and visual communication.</td>
<td>Written and visual communication skills developed. - Skills in this course</td>
<td>Not assessed in this course</td>
</tr>
<tr>
<td>CO 3 - Empirical and Quantitative Skills</td>
<td>To include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions.</td>
<td>-Skills in this course</td>
<td>Not assessed in this course</td>
</tr>
<tr>
<td>CO 4 - 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>Skills developed and assessed in lab every even spring</td>
<td>See lab syllabus</td>
</tr>
<tr>
<td>CO 5 - Personal Responsibility</td>
<td>To include the ability to connect choices, actions and consequences to ethical decision-making.</td>
<td>NA</td>
<td>Not assessed in this course</td>
</tr>
<tr>
<td>CO 6 - Social Responsibility</td>
<td>To include intercultural competence, knowledge of civic responsibility, and the ability to engage effectively in regional, national, and global communities.</td>
<td>NA</td>
<td>Not assessed in this course</td>
</tr>
</tbody>
</table>

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 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

### CHE 111 Laboratory - Tentative Course Calendar

<table>
<thead>
<tr>
<th>Date</th>
<th>Lab Exercise/Assignment/Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug. 27</td>
<td>NO Lab meeting; Watch the following Safety Video by the American Chemical Society. Take notes on the video, study the notes, and be prepared to take a quiz on Sept. 04. The link to the safety video is: <a href="https://www.youtube.com/watch?v=MARP5Ti33II">https://www.youtube.com/watch?v=MARP5Ti33II</a></td>
</tr>
</tbody>
</table>
| Sept. 03 | **Lab #1: Density of Pennies Laboratory** complete pre-lab for density before coming to lab. Quiz 1 – Covers safety video and safety rules in lab manual and pre-lab information  
**Instruction:** Density measurements and calculations. Read the Teamwork Expectation section in the syllabus.  
**Assignment:** CHECK INTO LABORATORY DRAWERS  
1) Complete density laboratory and perform all calculations  
2) Evaluate data, discuss findings, and provide a written summary and conclusion of your results.  
3) Turn in Density Laboratory Report before leaving lab. |
| Sept. 10 | **Lab #2: Density of Water Laboratory **GROUP 1– complete pre-lab before coming to lab. Quiz 2 – Density calculations, teamwork expectations, and pre-lab information  
**Instruction:** Density, graphing and calculation. Read critical thinking information in syllabus.  
**Assignment:**  
1) Complete density laboratory and perform all calculations  
2) Graph data appropriately  
3) Evaluate data, discuss findings, and provide a written summary and conclusion of your results.  
4) Turn in Density Laboratory Report before leaving lab. |
| Sept. 17 | **Lab #2: Density of Water Laboratory **GROUP 2– complete pre-lab before coming to lab. Quiz 2 – Density calculations, teamwork expectations, and pre-lab information  
**Instruction:** Density, graphing and calculation. Read critical thinking information in syllabus.  
**Assignment:**  
1) Complete density laboratory and perform all calculations  
2) Graph data appropriately  
3) Evaluate data, discuss findings, and provide a written summary and conclusion of your results. |
<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Details</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sept 24</td>
<td>Lab #3: Concentration and Dilution Laboratory GROUP 1 – complete pre-lab before coming to lab</td>
<td>Quiz 3 – Density calculations, graphing, and pre-lab information Instruction: Concentration units, dilution and solution calculations, how to make a solution, information about spectrophotometers. Read syllabus about communications skills in the sciences Assignment 1) Complete concentration and dilution lab 2) Discuss results with team. 3) Turn in laboratory report before leaving lab</td>
<td>Turn in Density Laboratory Report before leaving lab.</td>
</tr>
<tr>
<td>Oct. 01</td>
<td>Lab #3: Concentration and Dilution Laboratory GROUP 2 – complete pre-lab before coming to lab</td>
<td>Quiz 3 – Density calculations, graphing, and pre-lab information Instruction: Concentration units, dilution and solution calculations, how to make a solution, information about spectrophotometers. Read syllabus about communications skills in the sciences Assignment 1) Complete concentration and dilution lab 2) Discuss results with team. 3) Turn in laboratory report before leaving lab</td>
<td>Turn in Density Laboratory Report before leaving lab.</td>
</tr>
<tr>
<td>Oct. 8</td>
<td>Lab #4: Chemical Reactions ALL STUDENTS – complete pre-lab before coming to lab</td>
<td>Quiz 4 – concentration and dilutions, and communication skills, and pre-lab information Instruction: Types of chemical equations, balancing chemical equations. Read syllabus about empirical and quantitative skills Assignment: 1) Carry out assigned chemical reaction in lab 2) Discuss findings and write as summary and conclusion 3) Turn in Laboratory Report before leaving lab</td>
<td>Turn in Balancing Chemical Reactions Assignment.</td>
</tr>
<tr>
<td>Oct 15</td>
<td>Midterm Exam (95 pts) – covers everything through October 8</td>
<td>Turn in Balancing Chemical Reactions Assignment.</td>
<td>Time permitting work on Balancing Chemical Reactions Assignment.</td>
</tr>
<tr>
<td>Oct. 22</td>
<td>Introduction to Titration</td>
<td>Quiz 5 – Concepts most missed on midterm Instruction: Review of chemical concepts needed for titration, demonstrate how to perform titrations, teamwork, empirical/quantitative skills, emphasize good communication among group members to accomplish task, analyze data so conclusion(s) can be made. Information about the group teamwork rubric for assessment.</td>
<td>Turn in Balancing Chemical Reactions Assignment.</td>
</tr>
<tr>
<td>Oct. 29</td>
<td>Lab #5: Titration I: General Acid/Base Titration – complete pre-lab before coming to lab</td>
<td>Quiz 6 – covers information from the pre-lab. Assignment: 1) Perform practice titration using NaOH and HCl with indicator to determine endpoint quantitatively 2) Have each team member explain one calculation to the rest of the team 3) Discuss team plan for accomplishing tasks for next week. 4) Turn in Laboratory Report before leaving lab</td>
<td>Turn in Balancing Chemical Reactions Assignment.</td>
</tr>
<tr>
<td>Nov. 05</td>
<td>Lab #6: Titration II: Experimental Control for Antacid Titration – complete pre-lab before coming to lab</td>
<td>Quiz 7 – covers pre-lab information &amp; titration calculations Assignment: 1) Perform simple titrations using pH indicator to determine endpoint qualitatively 2) Use data to perform titration calculations 3) Have each team member explain one calculation to the rest of the team 4) Discuss team plan for accomplishing task. 5) Turn in Laboratory Report before leaving lab</td>
<td>Turn in Balancing Chemical Reactions Assignment.</td>
</tr>
<tr>
<td>Nov 12</td>
<td>Lab #7: Titration III: Comparison of Name Brand and Generic - complete pre-lab before coming to lab</td>
<td>Assignment: 1) Perform practice titration using NaOH and HCl with indicator to determine endpoint quantitatively 2) Discuss results with team. 3) Turn in Laboratory Report before leaving lab</td>
<td>Turn in Balancing Chemical Reactions Assignment.</td>
</tr>
</tbody>
</table>
coming to lab

Quiz 8: titration calculations/questions

Assignment:
1) Perform titration using generic brand antacid
2) Perform titration using name brand
3) Compare results – if different then repeat.
4) Analyze data and provide conclusion of antacid analysis.
5) Turn in Laboratory Report before leaving lab

<table>
<thead>
<tr>
<th>Date</th>
<th>Event/Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nov. 19</td>
<td>THANKSGIVING HOLIDAYS – NO LAB</td>
</tr>
<tr>
<td>Nov. 26</td>
<td>Lab #8: Importance of Buffers and pH Report/Summary of Titration Experiment (with Excel Graphs Due) Teamwork rubric due;</td>
</tr>
<tr>
<td></td>
<td>Assignment:</td>
</tr>
<tr>
<td></td>
<td>1) Determine which sample acts as a buffer</td>
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<td></td>
<td>2) Compare reaction rate of O₂ production at different pH/buffers.</td>
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<tr>
<td></td>
<td>3) Turn in Laboratory Report before leaving lab.</td>
</tr>
</tbody>
</table>

CHECK OUT OF LABORATORY DRAWER

<table>
<thead>
<tr>
<th>Date</th>
<th>Event/Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec. 03</td>
<td>Laboratory Final (95 pts) – covers titration labs and buffer labs</td>
</tr>
</tbody>
</table>