Class Syllabus  
Spring 2016  
CHE 111L  
Introductory Chemistry I Laboratory  
Sections 026, 027 & 028

Professor: Dr. ‘Tayo Odunuga  
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Office: 122 Math Building  
Office Hours: M-F, 9:00 – 10:00 a.m., M, 1 – 2 p.m.  
Lab time and place: T, 12:30 – 2:20 p.m., Room 106 Chemistry Bldg.

TEXT AND OTHER MATERIALS:  
- Introductory Chemistry Lab (CHE 111L) Laboratory Manual 14th ed., by Drs. Harris, Odunuga & Onchoke. This manual is available at local bookstores.  
- A scientific calculator.  
- Pencil, eraser and ruler for graphing

COURSE REQUIREMENTS:  
The course evaluation consists of weekly experiments or dry-labs, quizzes, a mid-term and a final exam. Attendance is mandatory. The quizzes will cover materials from previous lab and current pre-lab. Experiment Report sheets are due the day that each laboratory experiment is performed. No data sheets will be accepted after the date the actual experiment was performed. Grade of “0” will be given for any experiment for which a data sheet is not submitted on the actual experiment date.

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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<tbody>
<tr>
<td>10 Labs</td>
<td>100</td>
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<tr>
<td>10 Quizzes</td>
<td>50</td>
</tr>
<tr>
<td>Exams (1 Midterm &amp; 1 Final Exam)</td>
<td>100</td>
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<tr>
<td>TOTAL</td>
<td>250</td>
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Grading scale as a % - A= 100 – 90, B= 89 – 80, C= 79 – 70; D= 69 – 60; F= 59 and below

[A ≥ 225; B ≥ 200; C ≥ 175; D ≥ 150; F< 150]

Course calendar  
Laboratory quizzes (50 points)  
- Quizzes will be given every week; each laboratory quiz is worth 5 points.  
- Anyone coming in late (after the quizzes have been taken up) will not be allowed to take the quiz. The grade will be a ZERO for that quiz.  
- The laboratory quiz will cover the laboratory from the previous week as well as the pre-lab assignment for that day.
Experiments/Assignments (100 points)
- Each report sheet for the experiment or the assignment is worth 10 points.
- The report sheets will be turned in at the end of the laboratory period, unless otherwise stated by the instructor.
- Any assignment turned in at a later time will not be graded.

Mid-term and Final Exams (100 points)
- A midterm exam will be given March 8 during the laboratory period. It will cover material from the first week of the semester through Lab #6.
- The final exam will be given May 3 during the laboratory period. It will cover material from Labs #7-11
- The mid-term and final exams are worth 50 points each.

Make-up Policy: There will be no make-up quizzes or labs since the lowest quiz and lab grades will be dropped. An absence will constitute the lowest grade.

Attendance Policy:
- Attendance of class is mandatory. One excused absence is allowed. Any other absence will result in a zero for the lab.
- Three or more absences will result in an F for the semester.

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/.

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, close-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.
<table>
<thead>
<tr>
<th>Date</th>
<th>Lab Exercise/Assignment/Activity</th>
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| Jan 19 | **Class meets to discuss assignments**  
**Before coming to the first lab on January 26**  
**Instruction:** Read the safety rules on page 3 of the Laboratory Manual AND 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 Monday, January 26, at the beginning of the lab period.  
The link to the safety video is: [https://www.youtube.com/watch?v=0zHev9IM8kU](https://www.youtube.com/watch?v=0zHev9IM8kU)  
**Instruction:** Read the Teamwork Expectation section included in the syllabus |
| Jan 26 | #1: Laboratory Introduction, Communication, Scientific/Exponential/Conversions (p. 5)  
**Quiz 1 – Safety & Teamwork**  
**Instruction:** Scientific Communication, Significant Figures/Scientific Notation  
**Assignment:**  
1) Begin memorizing names/symbols of elements in Table 1 on page 4 of the Laboratory Manual  
2) Work on Significant Figures, Scientific/Exponential Notation Lab Assignment.  
**The Assignment will be due at the beginning of lab on February 03.**  
**CHECK INTO LABORATORY DRAWERS** |
| Feb 02 | #2 Density Laboratory (p. 14).  
**Quiz 2 – Elements from Table 1 (p. 4), Scientific Communication, Exponential/Scientific notation & calculations, conversions**  
**Instruction:** Critical Thinking - see information 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. |
| Feb 9 | #3 Purification of Water (p.22)  
**Quiz 3 – graphing, density, conversions, scientific notation, critical thinking**  
**Instruction:** Pure substances and mixtures, sediments, etc., data collection and analysis.  
**Assignment:**  
1) Complete Laboratory exercise  
2) Summarize data collected  
3) Write conclusion to experiment  
4) Turn in Laboratory Report before leaving lab. |
| Feb 16 | #4 Nomenclature (p.30)  
**Quiz 4 – purification of water, information from Nomenclature pre-lab**  
**Instruction:** How to name compounds, pulling information together to develop skills to name compounds correctly  
**Assignment**  
1) Complete Laboratory assignment of naming compounds correctly.  
2) Discuss naming rules/applications with team.  
3) Turn in Laboratory Report before leaving lab. |
| Feb 23 | #5 Polarity/Solubility(p. 35)  
**Quiz 5 – covers nomenclature and pre-lab information for Polarity/solubility**  
**Instruction:** Quantitative Skills and Critical Thinking. How to synthesize various concepts and apply to the topic of polarity and solubility.  
**Assignment:**  
1) Complete Laboratory assignment  
2) Reflect on issues of oil spills and/or pollution in waterways and how it relates to the polarity and solubility of the substance contaminating the waterway. |
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<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Assignments</th>
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<tbody>
<tr>
<td>Mar 01</td>
<td>#6: Chemical Reactions (p.43) Quiz 6 – covers information from pre-lab and from Polarity/Solubility lab</td>
<td>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 4) Time permitting work on Balancing Chemical Reactions Assignment.</td>
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<tr>
<td>Mar. 8</td>
<td>Midterm Exam – covers everything through March 01</td>
<td>Turn in Balancing Chemical Reactions Assignment.</td>
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<td>March 15</td>
<td>Spring Break</td>
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<td>Mar. 22</td>
<td>#7 Titration I: General Acid/Base Titration (p. 51) Quiz 7 – covers information from the pre-lab</td>
<td>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. 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 task for next Titration Lab. 4) Turn in Laboratory Report before leaving lab</td>
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<td>Mar. 29</td>
<td>Review session</td>
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<td>Apr. 5</td>
<td>#8: Titration II: Experimental Control for Antacid Titration p (56) – complete pre-lab before coming to lab Quiz 8 – covers pre-lab information/calculations only</td>
<td>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>
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<td>Apr. 12</td>
<td>#9: Titration III: Comparison of Name Brand and Generic (p 60) complete pre-lab before coming to lab Quiz 9 – covers pre-lab information/calculations and information from Titration II lab</td>
<td>Assignment: 1) Perform titration using generic brand antacid 2) Perform titration using name brand 3) Analyze data and provide conclusion of antacid analysis. 4) Take Lab Report home to do post-lab questions</td>
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<td>Apr. 19</td>
<td>#10: Turn in Titration III Lab Report (10 points) and Answers to Post-lab questions (10 points) Quiz 10: titration information and calculations Instruction: Acids/Bases/Buffer information</td>
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<td>Apr. 26</td>
<td>#11: Acids/Bases/Buffers/Making a Buffer (p. 72) Quiz 11 – covers pre-lab</td>
<td>Assignment: 1) Complete assignment involving calculations concerning acids bases and buffers. 2) Make solutions needed to prepare buffer and determine pH 3) Make buffer and explore the properties of a buffer 4) Turn in Laboratory Report before leaving lab 5) Check out of drawers</td>
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<tr>
<td>May 03</td>
<td>Laboratory Final – covers titration labs and buffer labs</td>
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Note: This syllabus is subject to change at the Instructor’s discretion.
Dr. ‘Tayo Odunuga
January 18, 2016
CORE OBJECTIVES AND RESOURCES

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.


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

Core Objective 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