CHE 133 Syllabus
Spring 2020

Course Description: Atomic and molecular structures, stoichiometry, gas laws and thermodynamics.

Number of Credit Hours: 3 semester hours - 3 hours lecture per week
Course Prerequisites and Corequisites: Prerequisite: MTH 138. Corequisite: CHE 133L

Program Learning Outcomes: There are no specific program learning outcomes for this major addressed in this course. This course is a general education core curriculum course and a service course.

General Education Core Curriculum Objectives:
- To understand and apply method and appropriate technology to the study of natural sciences.
- To recognize scientific and quantitative methods and the differences between these approaches and other methods of inquiry and to communicate findings, analyses, and interpretation both orally and in writing.
- To demonstrate knowledge of the major issues and problems facing modern science, including issues that touch upon ethics, values, and public policies.
- To demonstrate knowledge of the interdependence of science and technology and their influence on, and contribution to, modern culture.

Course Objective: To provide students with an explanation of the basic concepts of chemistry and to apply these concepts to problem solving involving critical thinking.

Student Learning Outcomes: Upon completion of this course, the students are expected to:
- apply chemistry concepts using critical thinking skills and the scientific method to analyze and evaluate information to reach conclusions within problem sets and lab experiments. (COs 1 & 3)
- use communication skills to demonstrate their interpretation and analysis of scientific data and express their ideas and thoughts to team members. (CO 2)
- apply logic, quantitative reasoning, and pattern recognition to analyze and evaluate numerical data/observable facts to reach conclusions within problem sets and lab experiments. (COs 1 & 3)
- demonstrate the ability to cooperate within groups to gather results of an experiment, analyze data, and draw conclusions using communication skills. (COs 2 & 4)

Hour Justification: This course is for 3 credits and spans 15 weeks. The course contains extensive content requiring students to prepare by completing the assigned weekly reading, homework, online content, etc. Students have significant weekly reading and homework assignments involving critical thinking and quantitative reasoning. Students are tested over the material via several exams during the semester including a comprehensive final exam. These activities average at a minimum 6 hours of work each week to prepare outside of time spent engaging with the content.

General Education Core Curriculum Objectives: The Texas Higher Education Coordinating Board has identified six core learning objectives: 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. General Chemistry 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 in the laboratory portion of the course that fulfills both the requirements of the lab and the needs of Stephen F. Austin State University’s Core Curriculum Assessment Plan with the Texas Higher Education Coordinating Board. When you complete this one assignment, you need to upload the assignment to both the General Chemistry Dropbox and the Teamwork Dropbox. Please note that this only applies to the specific assignment listed in the matrix below. All other assignments should be submitted according to regular class operations. If you have any questions, please see your instructor or contact the University Assessment Specialist at (936) 468-1267 or jstringfield@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 the D2L Teamwork dropbox this semester, and the date the assignment(s) should be uploaded to the D2L Teamwork dropbox. Not every assignment will be submitted for core assessment every semester. Your instructor will notify you which assignment(s) must be submitted for assessment in the D2L Teamwork dropbox.

<table>
<thead>
<tr>
<th>Core Objective</th>
<th>Definition</th>
<th>Course Assignment Topics</th>
<th>Chapters</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>Classification of Reactions, Solubility Rules, Limiting Reactant, Lewis Diagrams, Valence Shell Electron Pair Repulsion Theory</td>
<td>3, 4, 8, 9</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>Developed in Laboratory</td>
<td></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>Stoichiometry, Significant Figures, Thermodynamics, Gas Laws</td>
<td>1, 3, 5, 10</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>Developed in Laboratory</td>
<td>See lab syllabus</td>
</tr>
</tbody>
</table>

Outline of Topics (approximate course time):
Chemistry and Measurement (5-15%)
Atoms, Elements, Molecules, Ions, and Compounds (5-15%)
Chemical Formulas and Equations (5-15%)
Chemical Reactions (5-15%)
Thermochemistry (5-15%)
Quantum Theory of the Atom (5-15%)
Periodic Properties of the Elements (5-15%)
Chemical Bonding – Lewis Structures (5-15%)
 Molecular Geometry and Bonding Theory (5-15%)
Gases (5-15%)
Liquids, Solids, and Intermolecular Forces (5-15%)
Solutions (5-15%)
**Department of Chemistry and Biochemistry**  
**Dr. Darrell Fry**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Spring 2020</th>
<th><strong>Fry’s email</strong></th>
<th><a href="mailto:frydr@sfasu.edu">frydr@sfasu.edu</a></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Course Number</strong></td>
<td>CHE 133.003 &amp; CHE 133.004</td>
<td><strong>Office Location</strong></td>
<td>Bush Math 120</td>
</tr>
</tbody>
</table>
| **Meeting Times** | 003: MWF 11-11:50  
004: MWF 10-10:50 | **Student Hours** | MW 12:30-1:30  
T 2-4 p.m.  
& by appointment |
| **Course Location** | Lehmann Chem 106 | **Recitation Time & Recitation Location** | M 3:3:50  
Bush Math 101 |
| **Recitation Time** | | **i-assign** | TEACHER: 1070: Course 2 |
| **i-assign** | | |

**Required Text and Materials:**  
OpenStax *Chemistry 2nd edition* can be found at: [https://openstax.org/details/books/chemistry-2e](https://openstax.org/details/books/chemistry-2e).  
A scientific calculator (either graphing or non-graphing is fine; must be able to do scientific notation)

**Grading Policy:**  
**GRADES ARE BASED UPON PERFORMANCE.** The table below details how the points available in the course. The 10 points scale will be used to assign letter grades (i.e. \( \geq 90\% = A; \) etc.)

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DATES Or Description</th>
<th>TIME ALLOTED</th>
<th>POINT VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 24\textsuperscript{th} Quiz</td>
<td>Early in the semester</td>
<td>50 minutes</td>
<td>50</td>
</tr>
<tr>
<td>Mar 6 Quiz</td>
<td>Friday before Spring Break</td>
<td>50 minutes</td>
<td>50</td>
</tr>
<tr>
<td>Apr 8 Quiz</td>
<td>Wednesday before Easter</td>
<td>50 minutes</td>
<td>50</td>
</tr>
<tr>
<td>May 1 Quiz</td>
<td>last day of Dead Week</td>
<td>50 minutes</td>
<td>50</td>
</tr>
<tr>
<td>Seven Quizzes @ 50 each</td>
<td>given during Recitation</td>
<td>50 minutes</td>
<td>350</td>
</tr>
<tr>
<td>i-assign</td>
<td>DUE May 4\textsuperscript{th} no exceptions</td>
<td>All semester</td>
<td>100</td>
</tr>
<tr>
<td>Final Exam</td>
<td>As per final exam schedule</td>
<td>2.5 hours</td>
<td>100</td>
</tr>
<tr>
<td>LOWEST QUIZ</td>
<td></td>
<td></td>
<td>-50</td>
</tr>
<tr>
<td>TOTAL POINTS</td>
<td></td>
<td></td>
<td>700</td>
</tr>
</tbody>
</table>

**i-assign**—i-assign is a free electronic homework delivery and grading system. Any computer capable of connecting to the internet can assess the homework system at [http://i-assign.com](http://i-assign.com)  
Enter teacher’s 4-digit ID: 0170, course number: 2, your 4-digit ID#: XXXX (see list handed out first day) your student password: XXXXXXXX (see list handed out first day; make certain it is an 8 digit number). First time you log in, please identify yourself on Main Menu screen and change password if you desire. All i-assign is DUE May 4\textsuperscript{th}—no exceptions or extensions will be given. Normally, I drop the lowest 2 i-assign (based upon percentage) and count the remaining 58 out of 56. This gives you a nice bonus if you keep up with i-assign.

**Quizzes**—Only the highest 10 quizzes will count. Quizzes may be multiple choice, short answer, problems, essay and/or labeled diagrams. When you are instructed to show your work, then you must show your work for any credit. Partial credit may or may not be assigned—but will only be assigned based upon the work shown. All quizzes are comprehensive; however, they tend to focus on the most recent material. You must be prepared to finish the exam in the allotted time period—this will require you to practice the material multiple times. If you miss a quiz, you must provide a documented excuse—Dr. Fry decides if the excuse is valid (not you). With a single missed quiz (excused absence) then your percentage on the final exam will replace the missed quiz. In the rare event you miss multiple quizzes, you will be given makeup quizzes at a time convenient for Dr. Fry.

**Final Exam**—the final exam will be comprehensive and multiple choice.

You must take the final and at least 8 of the 11 quizzes in order to get any grade beside a F or QF (please note you can still make an F if you take everything with failing grades).
POLICY & EXPECTATIONS PAGE

Attendance Policy and Participation:

- **Attendance** and **in-class participation** are important aspects of this course. Therefore, I will initially assign each student 2 points to his/her final average. For every unexcused absence in excess of two, I will subtract 1 point from the course average. Students who are using cell phones during class and/or not participating will be asked to leave class and this will count as an unexcused absence.

- **Out of politeness**, tell instructor if there are circumstances in which you may arrive late or leave early.

- Assigned seats will be given.

Classroom Behavior Expectations and POLICIES:

- Sit in your assigned seat.
- Do the homework until you understand the material.
- Learn the material.
- Come to class prepared by spending at least 2 hours working problems and reviewing previous material before each class period and **be on time** and in your seat.
- Absences may be assigned to anyone that disrupts class, sleeps in class, or consistently comes in late or leaves early. Read Attendance Policy Section to see how attendance will impact your course grade. Read Grade Policy Section to see how attendance will impact your course grade.
  - Absences and tardiness are unacceptable.
  - **TURN OFF YOUR CELL PHONES WHEN YOU COME TO CLASS!** If I see you using a cell phone in class, I will kick you out of class and count it as an unexcused absence.
  - You are not allowed to read other materials (e.g. newspapers) or study for another course while in class. If I see you doing this, I will kick you out of class and count it as an unexcused absence.
  - You are not allowed to sleep in class. If I catch you sleeping, I will kick you out of class and count it as an unexcused absence.
  - You are not allowed to have a computer, tablet or other electronic device out during class. If I catch you sleeping, I will kick you out of class and count it as an unexcused absence.
- Bring a scientific calculator to class. Cell phones may NOT be used on quizzes or exams. If you have to use the facilities during a test, turn in your cell phone while away.
- Be courteous and respectful of other students, SI leader, and instructor.
- Significant figures are required on all answers given on quizzes, assignments and exams.
- Cheating…not allowed or respected. Will result in a zero with no chance of making up assignment.
- Dress appropriately for the course/laboratory. In a course we will be using the portion of the dress policy as Campus Rec given below:
  - You must wear a shirt at all times inside the facility and must wear attire that covers your abdomen, nipples and gluteal fold.
- Do not email fry through the d2l system. Do not email fry through the advising software. Instead email me directly at frydr@sfasu.edu.
- ZOOM OFFICE HOURS: due to the nature of the software, I will not discuss individual grades during this office hour. You can stop by my office for traditional office hours MWF 12:30-1:30 p.m. and/or T 2-4 p.m.. You may also email me to set-up an appointment. The official invitation can be found on d2l or you can enter the meeting code 812 688 126 into the ZOOM APP on your smart phone.
- Questions regarding grading will not be answered immediately after or prior to class. Please come by my office during my office hours with your question and I will address it there.
- Keep all of your graded work and compare the score on your paper with that listed on D2L. If there is a discrepancy, bring it to my attention ASAP.

Students who violate these policies will be told to leave the classroom. Repeat offenders will be subject to disciplinary action in accordance with University policies as described in the Code of Student Conduct.
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.

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.

Withheld Grades Semester Grades Policy (A-54):
Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average.

The circumstances precipitating the request must have occurred after the last day in which a student could withdraw from a course. Students requesting a WH must be passing the course with a minimum projected grade of C.

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 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.
Tentative Course Calendar and Order of Topics:
Jan 15th- Jan 22nd
1. element nomenclature: 16 questions; Periodic Law and elements 1-36, 47, 79, 80, 92.
2. The Scientific Method: 10 MC questions
3. states of matter: 5 questions
4. classification of matter: 12 questions; % by mass; Law of Constant Proportions
5. simple dimensional analysis: 10 questions

Quiz 1: Friday 1/24/2020; go through 1/27/2020 in recitation

Jan 27th – Jan 31st
6. # of sig figs
7. add/subtract sig figs
8. multiply/divide sig figs
9. mixed operations sig figs
10. standards and units
11. accuracy and precision

Tentatively Quiz 2: Monday 2/3/2020

Feb 3rd – Feb 7th
12. Atomic Theory: Dalton to Rutherford
13. electrons protons and neutrons
14. Ions
15. isotopes
16. Molar and Ionic Compounds
17. using the chemical formula

Feb 10th – Feb 14th
18. The Mole and Avogadro's Number
19. Molar Mass (posted)
20. Empirical and Molecular Formula

Tentatively Quiz 3: Monday 2/17/2020

Feb 16th – Feb 21st
21. Molarity
22. Reactants and products
23. Balancing chemical equations
24. Types of Reactions
25. grams to moles to moles to grams

Feb 24th – Feb 28th
26. Theoretical & Percent Yield
27. Direction of Heat Flow
28. Specific Heat and Delta H
29. Hess's Law

Tentatively Quiz 4: Monday 3/2/2020

Mar 2nd – Mar 6th (Mar 9st - Mar 13th is Spring Break)
30. EM Radiation
31. Bohr Model

Quiz 5: Cumulative Multiple Choice Friday 3/6 in class (Fry not present)
Mar 16th – Mar 20th
32. de Broglie Wavelength
33. Quantum Numbers
34. Electron Configurations
35. Periodic Trends

**Tentatively Quiz 6: Monday during recitation 3/23/2020**

Mar 23th – Mar 27th
36. Lewis Structures w/formal charge
37. Exceptions to Octet Rule
38. Molecular Geometry
39. Polarity (posted)
40. Multiple Bonds

**Tentatively Quiz 7: Monday during recitation 3/30/2020**

Mar 30th – Apr 3rd
41. Valence Bond Theory
42. Molecular Orbital Theory
43. Intermolecular Forces

Apr 6th – Apr 8th (Apr 10th is part of Easter Break)
44. Pressure
45. Boyle's Law
46. Charles' Law
47. Avogadro's Law
48. Ideal Gas Law
49. Dalton's Law

**Tentatively Quiz 8: Monday during recitation 3/30/2020**

Apr 13th – Apr 17th
50. Stoichiometry and Gases
51. KMT and Graham's Law

**Quiz 9: Cumulative Multiple Choice in class Wednesday 4/8/2020 (before Easter Break)**

Apr 20th – Apr 24th
52. Real Gases
53. Titration and Stiochiometry and Gases
54. Thermodynamics of Phase Diagrams
55. Molality

**Tentatively Quiz 10: Monday 4/20/2020**

Apr 27th - May 1st
56. Vapor Pressure Lowering
57. boiling point elevation
58. freezing point depression
59. osmolarity
60. van Hoft factor

**Quiz 11: Cumulative Take-Home Friday 5/1/2020; Quiz 11 will replace the lowest quiz grade for students with 2 or fewer excused absences (recitation and class).**