Course Syllabus  
Fall 2018  
CHE 134 001  
General Chemistry II

**Course Description:** Equilibrium, kinetics, redox, descriptive chemistry and radiochemistry.  
**Number of Credit Hours:** 3 semester hours

**Course Prerequisites and Corequisites:** Prerequisites: CHE 133, 133L, and MTH 138. Corequisite: CHE 134L if enrolled in other courses on campus.

**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.

**Core Objectives (CO):**
1. Critical Thinking: to include creative thinking, innovation, inquiry and analysis, evaluation and synthesis of information.
2. Communication Skills: to include effective development, interpretation and expression of ideas through written, oral, and visual communication.
3. Empirical and Quantitative Skills: to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions.
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.

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

**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 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></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 through written, oral, and visual communication.</td>
<td></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></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>Assessed in lab</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></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></td>
<td>Not assessed in this course</td>
</tr>
</tbody>
</table>

**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. (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)
Instructor: Dr. Kefa K. Onchoke
Department: Chemistry
E-mail: onchokekk@sfasu.edu (Use this e-mail address in order to get quick response)
Phone: 936-468-2386
Office: M-118 (Math Building)
Desire2Learn: http://d2l.sfasu.edu
Office Hours: M 10-12, T 11 -1; W 11-1; R 4 – 5 p.m.; F 11-12
Lecture times: T R 8:00 am - 9:15 am, in Chemistry 106

CATALOG DESCRIPTION: General Chemistry II (1312) – Equilibrium, kinetics, redox, and descriptive chemistry.

PREREQUISITES: CHE 133 and 133L

TEXT AND MATERIALS:
1. Required: Brown, Theodore E. | LeMay, H. E. | Bursten, Bruce E. | Murphy, Catherine | Woodward, Patrick | Stoltzfus, Matthew E.
2. Scientific calculator (non-graphing and non-programmable); for example, SHARP EL-501WBBK, CASIO 115, Texas Instrument 30 XIIS. No programming or graphing calculators are to be used in exams and/or quizzes.

4. Mastering Chemistry Website (For online Homework):
   http://www.pearsonmylabandmastering.com/northamerica/masteringchemistry/
   a. You need first three things to register for the assignments:
      E-mail

      For CHE 134-001: Course Name: CHE_134-001_F2018 Description: CHE 134;
      Course ID: onchoke77003
      ** The Mastering Chemistry Online Homework system will be used for all assigned homework problems

      Access Code or Credit Card

   b. You will purchase the access code online or use a Credit card
   c. Instruction for logging to textbook Students:
      i. Go to http://masteringchemistry.com and register at the top right.
      ii. If you already have a Mastering Chemistry account, log and go to step 3 in and follow the instructions.
      iii. Choose a password and timezone (Chicago), accept the site policy agreement, and click "Create my new account".
      iv. Click the "Create an Account" link. Supply the requested information and click "Create My Account". Check your email (and spam filter) for a message from Mastering Chemistry Learning and click on the link provided in that email.

5. Find your course in the list (you may need to expand the subject and term categories) and click the link.
6. If your course requires a key code, you will be prompted to enter it.
7. If your course requires payment, select a payment option and following the remaining instructions.
Once you have registered and enrolled, you can log in at any time to complete or review your homework assignments. During sign up or throughout the term, if you have any technical problems or grading issues, Go to Student Support section and explain the issue. The Mastering Chemistry support team is almost always faster and better able to resolve issues than your instructor.

**COURSE OBJECTIVES:** To provide students with an understanding of the general principles of inorganic chemistry and the ability to apply these principles to problem solving.

**STUDENT LEARNING OUTCOMES:** The student is expected to master and apply the following concepts to problem solving:

- Principles of reaction rates: reaction rates and concentration, reactant concentration with time, and reaction mechanisms.
- Principles of equilibrium: the equilibrium constant expression, determination of equilibrium constants, applications of the equilibrium constant to problem solving, and the effect of changes in conditions upon an equilibrium system.
- Principles of solubility: precipitate formation, use of the solubility product constant (K\text{sp}) to predict solubility, dissolution of precipitates, and qualitative analysis.
- Principles of thermodynamics: enthalpy and enthalpies of formation, the first law of thermodynamics, entropy and the second law of thermodynamics, the third of thermodynamics, and free energy.
- Principles of electrochemistry: voltaic and electrolytic cells, effect of concentration on cell voltage, standard cell potentials, and batteries.
**COURSE CALENDAR:** Course Material from the text will be covered in the following order.

**Review:** Key points in General Chemistry I and Chapter 27 Redox Reactions

PowerPoint: [Review](#)

<table>
<thead>
<tr>
<th>Video</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review HW 1 (32:02)</td>
<td>significant figures (Review pgs 1-7, 22-25 (Brown))</td>
</tr>
<tr>
<td>Review HW 2 (63:39)</td>
<td>Nomenclature (Review pgs 8-27)</td>
</tr>
<tr>
<td>Review HW 3 (16:04)</td>
<td>Molar mass / molarity (Review pgs 28-32)</td>
</tr>
</tbody>
</table>

**Online Homework**

Due 9/13

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**Chemical Kinetics**

PowerPoint: [Chapter 30](#)

<table>
<thead>
<tr>
<th>Video</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter 30 HW 5 (25:07)</td>
<td>Reaction rates (Chapter 30 pgs 1-15)</td>
</tr>
<tr>
<td>Chapter 30 HW 6 (20:23)</td>
<td>Reaction order (Chapter 30 pgs 16-26)</td>
</tr>
<tr>
<td>Chapter 30 HW 7 (20:45)</td>
<td>Determining rate law (Chapter 30 pgs 27-34)</td>
</tr>
<tr>
<td>Chapter 30 HW 8 (6:41)</td>
<td>Rate constant k units (Chapter 30 pg 35)</td>
</tr>
<tr>
<td>Chapter 30 HW 9 (24:59)</td>
<td>First order integrated rate law (Chapter 30 pgs 36-45)</td>
</tr>
<tr>
<td>Chapter 30 HW 10 (6:30)</td>
<td>Zero and second order rate laws (Chapter 30 pgs 46-47)</td>
</tr>
<tr>
<td>Chapter 30 HW 11 (15:14)</td>
<td>Half-life (Chapter 30 pgs 48-52)</td>
</tr>
<tr>
<td>Chapter 30 HW 12 (24:30)</td>
<td>Activation energy, catalysis, intermediates (Chapter 30 pgs 53-70)</td>
</tr>
<tr>
<td>Chapter 30 HW 13 (33:01)</td>
<td></td>
</tr>
</tbody>
</table>
### 30 Elementary steps and mechanisms (Chapter 30 pgs 71-90)

### Online Homework
Due 9/21

### EXAM I: Thursday, Sept. 20 from 6:00-8:00 pm - Room to be announced

#### 31 Chemical Equilibrium
PowerPoint: [Chapter 31](#)

<table>
<thead>
<tr>
<th>video: Chapter 31 HW 14 (40:24)</th>
<th>Chemical equilibrium (Chapter 31 pgs 1-20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>video: Chapter 31 HW 15 (8:52)</td>
<td>Determination of K (Chapter 31 pgs 21-30)</td>
</tr>
<tr>
<td>video: Chapter 31 HW 16 (14:06)</td>
<td>Manipulating K (Chapter 31 pgs 31-34)</td>
</tr>
<tr>
<td>video: Chapter 31 HW 17 (3:17)</td>
<td>Determination of K (heterogeneous) (Chapter 31 pgs 35-36)</td>
</tr>
<tr>
<td>video: Chapter 31 HW 18 (12:02)</td>
<td>Direction of reaction, Q (Chapter 31 pgs 37-43)</td>
</tr>
<tr>
<td>video: Chapter 31 HW 19 (17:30)</td>
<td>Calculation of equil partial pressures (part I) (Chapter 31 pgs 44-57)</td>
</tr>
<tr>
<td>video: Chapter 31 HW 20 (6:24)</td>
<td>Calc of equil partial pressures (part II) (Chapter 31 pgs 58-59)</td>
</tr>
<tr>
<td>video: Chapter 31 HW 21 (8:03)</td>
<td>Calc of equil partial pressures (part III) (Chapter 31 pg 60)</td>
</tr>
<tr>
<td>video: Chapter 31 HW 22 (13:55)</td>
<td>Calc of equil partial pressures (part IV) (Chapter 31 pgs 61-68)</td>
</tr>
<tr>
<td>video: Chapter 31 HW 23 (28:20)</td>
<td>LeChatelier's Principle (Chapter 31 pgs 69-81)</td>
</tr>
</tbody>
</table>

### Online Homework
Due 10/7

#### 32 Acids and Bases
PowerPoint: [Chapter 32](#)

| video: Chapter 32 HW 24 (39:08) | Bronsted-Lowry acids and bases (Chapter 32 pgs 1-21) |

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<table>
<thead>
<tr>
<th>Video</th>
<th>Duration</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chapter 32 HW 25</strong></td>
<td>39:52</td>
<td>Acid and base strengths (Chapter 32 pgs 22-35)</td>
</tr>
<tr>
<td><strong>Chapter 32 HW 26</strong></td>
<td>36:56</td>
<td>pH (Chapter 32 pgs 36-52)</td>
</tr>
<tr>
<td><strong>Chapter 32 HW 27</strong></td>
<td>15:50</td>
<td>pH of strong acids and bases (Chapter 32 pgs 53-55)</td>
</tr>
<tr>
<td><strong>Online Homework</strong></td>
<td>Due 10/13</td>
<td></td>
</tr>
</tbody>
</table>

**EXAM II: Thursday, Oct. 11 from 6:00 - 8:00pm**

**33 Acid-Base Equilibria**

PowerPoint: [Chapter 33](#)

<table>
<thead>
<tr>
<th>Video</th>
<th>Duration</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chapter 33 HW 28</strong></td>
<td>17:47</td>
<td>Weak acid ionization constant, $K_a$ (Chapter 33 pgs 1-10)</td>
</tr>
<tr>
<td><strong>Chapter 33 HW 29</strong></td>
<td>45:41</td>
<td>pH of weak acid (Chapter 33 pgs 11-25)</td>
</tr>
<tr>
<td><strong>Chapter 33 HW 30</strong></td>
<td>28:22</td>
<td>Polyprotic acids (Chapter 33 pgs 26-37)</td>
</tr>
<tr>
<td><strong>Chapter 33 HW 31</strong></td>
<td>3:37</td>
<td>Weak base ionization constant, $K_b$ (Chapter 33 pgs 38-40)</td>
</tr>
<tr>
<td><strong>Chapter 33 HW 32</strong></td>
<td>12:14</td>
<td>pH of weak base (Chapter 33 pgs 41-46)</td>
</tr>
<tr>
<td><strong>Chapter 33 HW 33</strong></td>
<td>35:53</td>
<td>Acid and base properties of salt solutions (Chapter 33 pgs 47-59)</td>
</tr>
<tr>
<td><strong>Chapter 33 HW 34</strong></td>
<td>7:15</td>
<td>Relationship between $K_a$ and $K_b$ (Chapter 33 pgs 60-62)</td>
</tr>
<tr>
<td><strong>Chapter 33 HW 35</strong></td>
<td>21:57</td>
<td>pH of salt solutions (Chapter 33 pgs 63-67)</td>
</tr>
<tr>
<td><strong>Chapter 33 HW 36</strong></td>
<td>51:54</td>
<td>Buffers (Chapter 33 pgs 68-76)</td>
</tr>
<tr>
<td><strong>Chapter 33 HW 37</strong></td>
<td>21:22</td>
<td>Preparation of a buffer (Chapter 33 pgs 77-83)</td>
</tr>
<tr>
<td><strong>Chapter 33 HW 38</strong></td>
<td>33:09</td>
<td>Strong acid and strong base titrations (Chapter 33 pgs 84-91)</td>
</tr>
</tbody>
</table>

**Due 10/31**

**Due 11/2**
**33 Weak strong titrations (Chapter 33 pgs 92-97) Due 11/2**

**Online Homework** Due 11/3

**34 Solubility and Complex-Ion Equilibria**
PowerPoint: Chapter 34

- **video: Chapter 34 HW 40 (20:38)**
  - Solubility product constant, $K_{sp}$ (Chapter 34 pgs 1-10)

- **video: Chapter 34 HW 41 (16:25)**
  - $K_{sp}$ and water solubility (Chapter 34 pgs 11-16)

- **video: Chapter 34 HW 42 (10:13)**
  - $K_{sp}$ and common-ion effect (Chapter 34 pgs 17-19) Due 11/11

- **video: Chapter 34 HW 43 (49:03)**
  - Precipitation formation (Chapter 34 pgs 20-44)

**Online Homework** Due 11/14

**EXAM III: Thursday, Nov. 8 from 6:00-8:00pm**

**29 Thermochemistry**
PowerPoint: Chapters 29 & 35

- **video: Chapter 29 HW 44 (25:35)**
  - First Law of Thermodynamics (Chapters 29 & 35 pgs 1-12)

- **video: Chapter 29 HW 45 (16:30)**
  - Hess’ Law (Chapters 29 & 35 pgs 13-18)

- **video: Chapter 29 HW 46 (13:56)**
  - Standard enthalpies of formation (Chapters 29 & 35 pgs 19-23)

**Online Homework** Due 11/21

**35 Chemical Thermodynamics**
PowerPoint: Chapters 29 & 35

- **video: Chapter 35 HW 47 (23:12)**
  - Second Law of Thermodynamics (Chapters 29 & 35 pgs 24-34)

- **video: Chapter 35 HW 48 (42:23)**
  - Gibbs Free Energy (Chapters 29 & 35 pgs 35-54)

**Online Homework** Due 11/25
36 Electrochemistry
PowerPoint: Chapter 36

- video: Chapter 36 HW 49 (82:28)
  Standard reduction potentials (Chapter 36 pgs 1-41)

- video: Chapter 36 HW 50 (43:32)
  Nernst equation (Chapter 36 pgs 42-61)

Online Homework Due 11/28

EXAM IV: Thursday Dec. 4 from 6:00-8:00pm

37 Nuclear Chemistry
PowerPoint: Chapter 37

- video: Chapter 37 HW 51 (43:08)
  Nuclear chemistry (Chapter 37 pgs 1-40)

Online Homework Due 12/7

Comprehensive Final – Thursday Dec. 13, 10:30 a.m. - 12:30 p.m. (in C-106)

MAKE-UP POLICY: Make-up exams can only be given for proven excuses.

GRADING POLICY:
4-one hour exams (100 pts per test) cumulative with emphasis on the material covered since last. These exams will be given on Sept. 20, Oct. 11, Nov. 8, and Dec. 4.

Final Exam – Comprehensive Final exam worth 200 pts. Exam will be given in C-106 as per University schedule.

Homework – Homework will total 100 points (#points correct*1000 / total points available). The homework assignments will be completed via MasteringChemistry.com with due dates assigned on a weekly basis. Any computer capable of connecting to the internet can access the homework system at Modified Masteringchemistry.com Enter your user name and access code.

Quizzes (50 pts) – At least one quiz will be given per week.

Method of Evaluation: The final grade will be based upon percentage of points obtained from Brown, Lemay, Bursten, Murphy & Woodward Textbook (14th edn):

<table>
<thead>
<tr>
<th>Exam Schedule</th>
<th>Points</th>
<th>Day/Date</th>
<th>Approximate Material Tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam I</td>
<td>100</td>
<td>Tuesday, Sept. 20, 6-8pm</td>
<td>Review, Chapt. 20.1-20.2, Chapt. 14, 15</td>
</tr>
<tr>
<td>Exam II</td>
<td>100</td>
<td>Tuesday, Oct. 11, 6-8 pm</td>
<td>Chapt. 15, Chapt. 16</td>
</tr>
<tr>
<td>Exam III</td>
<td>100</td>
<td>Tuesday, Nov. 18 6-8pm</td>
<td>Chapt. 17</td>
</tr>
<tr>
<td>Exam IV</td>
<td>100</td>
<td>Tuesday Dec. 4, 6-8pm</td>
<td>19, 20 &amp; 21</td>
</tr>
<tr>
<td><strong>Homeworks</strong></td>
<td><strong>100</strong></td>
<td><strong>At least one Quiz per week</strong></td>
<td>Assigned via MasteringChemistry.com</td>
</tr>
<tr>
<td><strong>Quizzes</strong></td>
<td><strong>50</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Comprehensive Final Exam</strong></td>
<td><strong>200</strong></td>
<td><strong>Thur., Dec. 13, 8:00 -10:00 am</strong></td>
<td><strong>Comprehensive</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>750</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Grading scale - A= 90 - 100%; B= 80 - 89%; C= 70 - 79%; D= 60 - 69%; F= below 60%
ATTENDANCE POLICY:
Attendance of class is mandatory. A total of four unexcused absences will result in the student being dropped from the class with a grade of "F". The exams will be given during the assigned times unless other arrangements are approved by the instructor prior to the scheduled exam time.

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.

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: To ensure a classroom environment conducive to learning, any forms of classroom disruptions will not be tolerated (examples but not limited to – talking, use of cell phones/beepers, sleeping, reading other material, eating/drinking). Students who violate these rules will be asked to leave. Repeat offenders will be subject to disciplinary action in accordance with University policies as described in the Code of Student Conduct.