Course Syllabus
CHE 133 002 (General Chemistry I)

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

Number of Credit Hours: 3 semester hours

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.

Course Prerequisites and Corequisites: Prerequisite: MTH 138. Corequisite: CHE 133L 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.

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. Although this chemistry course develops the first four core-learning objectives, it only submits assessment assignments to the University Core Assessment Committee every even spring for the teamwork general education core curriculum requirement. If this is an even spring semester, 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 the even spring 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 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.

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.

The chart below (in the Course Calender) 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.
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)

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%)
Gases (5-15%)
Thermochemistry (5-15%)
Quantum Theory of the Atom (5-15%)
Periodic Properties of the Elements (5-15%)
Chemical Bonding and Lewis Structures (5-15%)
Molecular Geometry and Bonding Theory (5-15%)
Liquids, Solids, and Intermolecular Forces (5-15%)
Solutions (5-15%)
Class Syllabus
SP 2020
CHE 133 002
General Chemistry I

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Department: Chemistry & Biochemistry
E-mail: Onchokekk@sfasu.edu (Use this e-mail for a timely response from Dr. Onchoke)
Desire2Learn: http://d2l.sfasu.edu
Phone: (936) 468-2386
Phone: 936-468-2386, Office: M-118 (Math Building)
Student Hours: M 12 - 1; W 11-1; R 4-5; F 12-1 and 4-5
Class Time: TR 8 – 9.15 am.; Room: C106

Text and Materials:
Note: Any chemistry textbook can be used as a resource to supplement the PowerPoint slides
Suggested textbooks
  Brown, T.L.; LeMay, Jr., H.E.; Bursten, B. E.; Murphy, C. J.; Woodward, P. M. Chemistry: The Central Science
  or

COURSE CALENDAR:
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.

NOTE: VIDEOS ARE AVAILABLE FOR EACH HOMEWORK SET IF YOU CHOOSE TO LISTEN AND VIEW THE POWERPOINT PRESENTATION AT THE SAME TIME. IF YOU PREFER TO VIEW THE POWERPOINT PRESENTATION AT YOUR OWN PACE, YOU MAY VIEW THE POWERPOINT PRESENTATION USING POWERPOINT ON YOUR COMPUTER. IF YOU DON’T HAVE POWERPOINT, YOU CAN DOWNLOAD A FREE POWERPOINT VIEWER FROM MICROSOFT. YOU CAN SEARCH FOR “POWERPOINT VIEWER” OR “POWERPOINT VIEWER MACINTOSH” ON THE INTERNET. THE POWERPOINT SLIDES WERE DESIGNED TO BE VIEWED THROUGH THE PRESENTATION FORMAT (CLICK BY CLICK). VIEWING ANY OTHER WAY WILL HINDER THE ANIMATIONS AND THE EDUCATIONAL VALUE OF THE SLIDES.
Material will be covered in the following topic order:

**Video:** Introduction (2:34) (time of video)

### Topic 1 – Chemistry and Measurements

**PowerPoint:** Topic 1

<table>
<thead>
<tr>
<th>Video: HW 1 (26:28)</th>
<th>HW 1 – Types of Matter/Properties (Topic 1 pgs 1-16)</th>
<th>Due 1/26</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video: HW 2-3 (19:45)</td>
<td>HW 2 – Math Review: Scientific Notation (Topic 1 pgs 17-21)</td>
<td>Due 1/29</td>
</tr>
<tr>
<td>HW 3 – Significant Figures (Topic 1 pgs 17-21)</td>
<td>CO 1: Instructors will demonstrate the use of critical thinking throughout the semester. Starting with the concept of significant figures in calculations and how important they are in the field of chemistry, instructors will perform unit conversions and show students the logical progression through the problems to a final answer. Students will model this exercise in additional problem sets for the development of critical thinking skills.</td>
<td>Due 1/29</td>
</tr>
<tr>
<td>Video: HW 4 (15:44)</td>
<td>HW 4 (15:43) – Calculations involving significant figures (Topic 1 pgs 22-24)</td>
<td>Due 1/29</td>
</tr>
<tr>
<td>Video: HW 5 (11:47)</td>
<td>HW 5 – Measurements (Topic 1 pgs 25-29)</td>
<td>Due 2/2</td>
</tr>
<tr>
<td>Video: HW 6 (7:30)</td>
<td>HW 6 – Temperature conversions (Topic 1 pgs 30-32)</td>
<td>Due 2/2</td>
</tr>
<tr>
<td>Video: HW 7 (9:23)</td>
<td>HW 7 – Density (Topic 1 pgs 33-36)</td>
<td>Due 2/2</td>
</tr>
<tr>
<td>Video: HW 8 (11:11)</td>
<td>HW 8 – Unit conversions (Topic 1 pgs 37-42)</td>
<td>Due 2/2</td>
</tr>
</tbody>
</table>

**CO1:** Instructors will continue to demonstrate the use of critical thinking skills in solving more complex problems. Instructors will provide the students with a detailed progression through how to develop a logical solution to unit conversion using the method of dimensional analysis. This method will be used in many different applications and it is critical the students learn how to apply it in chemical problems. Students will model this exercise in additional problem sets for the development of critical thinking skills.

### Topic 2 – Atoms, Elements, Molecules, Ions, and Compounds

**PowerPoint:** Topic 2

| Video: HW 9-10 (18:49) | |
### HW 9 – Atomic Theory: Dalton thru Rutherford (Topic 2 pgs 1-14)  
Due 2/5

### HW 10 – Electrons, Protons, Neutrons (Topic 2 pgs 1-14)  
Due 2/5

- **video:** HW 11 (5:20)
- **HW 11** – Atomic Masses (Topic 2 pgs 15-16)  
Due 2/5

- **video:** HW 12 (8:20)
- **HW 12** – Periodic Table (Topic 2 pgs 17-24)  
Due 2/9

- **video:** HW 13-14 (25:15)
- **HW 13** – Molecules and Ions (Topic 2 pgs 25-35)  
Due 2/9

- **HW 14** – Molecular and ionic compounds (Topic 2 pgs 25-35)  
Due 2/9

- **video:** HW 15-18 (22:28)
- **HW 15** – Polyatomic ions (Topic 2 pgs 36-45)  
Due 2/12

- **HW 16** – Compounds involving polyatomic ions (Topic 2 pgs 36-45)  
Due 2/12

- **HW 17** – Binary compounds (Topic 2 pgs 36-45)  
Due 2/12

- **HW 18** – Naming Acids (Topic 2 pgs 36-45)  
Due 2/12

- **video:** HW 19 (15:27)
- **HW 19** – Reactants, Products, & balancing equations (Topic 2 pgs 46-62)  
Due 2/16

### EXAM I (HW 1-19): Tuesday Feb. 11 from 5:00-7:00pm (CST) on campus (C106)

**Topic 3 – Mass Relations and Stoichiometry**

- **PowerPoint:** Topic 3

- **video:** HW 20-22 (19:58)
- **HW 20** – Mole concept (Topic 3 pgs 1-11)  
Due 2/23

- **HW 21** – More Mole concept (Topic 3 pgs 1-11)  
Due 2/23

- **HW 22** – Molar mass (Topic 3 pgs 1-11)  
Due 2/23

- **video:** HW 23 (27:28)
- **HW 23** – Empirical and Molecular formulas (Topic 3 pgs 12-23)  
Due 2/26

- **video:** HW 24 (8:40)
- **HW 24** – Quantitative Relationships (Topic 3 pgs 24-28)  
Due 2/26

**CO 3:** **Instructors** will demonstrate the process of quantitative reasoning using the concept of stoichiometry. This allows for the logical prediction of amounts used in reaction. The process requires the combination of many skills; nomenclature, balancing equations, stoichiometry, and unit conversions. **Instructors** will demonstrate how to logical analyze information using the above mentioned skills. **Students** will model this in additional problems sets for the development of quantitative reasoning skills.
CO 3: *Instructors* will demonstrate the process of quantitative reasoning using the concept of stoichiometry and applying it to specific types of reactions. This allows for the logical prediction of amounts used in reaction. The process requires the combination of many skills; nomenclature, balancing equations, stoichiometry, and unit conversions. *Instructors* will demonstrate how to logical analyze information using the above mentioned skills. *Students* will model this in additional problems sets for the development of quantitative reasoning skills.
### Topic 5 – Gases

**PowerPoint:** [Topic 5](#)

<table>
<thead>
<tr>
<th>Video</th>
<th>HW (Duration)</th>
<th>Due Date</th>
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<tbody>
<tr>
<td>HW 37</td>
<td>4:23</td>
<td>3/29</td>
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<tr>
<td>HW 37 – Pressure (<a href="#">Topic 5</a> pgs 1-5)</td>
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<tr>
<td>HW 38</td>
<td>3:03</td>
<td>3/29</td>
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<tr>
<td>HW 38 – Boyle’s Law (<a href="#">Topic 5</a> pgs 6-7)</td>
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<tr>
<td>HW 39</td>
<td>3:35</td>
<td>3/29</td>
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<tr>
<td>HW 39 – Charles’s Law (<a href="#">Topic 5</a> pgs 8-9)</td>
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<td>HW 40</td>
<td>2:42</td>
<td>3/29</td>
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<td>HW 40 – Gay-Lussac’s Law (<a href="#">Topic 5</a> pgs 10-11)</td>
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<td>HW 41</td>
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<td>HW 41 – Combined Gas Law (<a href="#">Topic 5</a> pgs 12-13)</td>
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<td>HW 42</td>
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<td>HW 42 – Avogadro’s Law (<a href="#">Topic 5</a> pgs 14-15)</td>
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<td>HW 43</td>
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<td>HW 43 – Ideal Gas Law (<a href="#">Topic 5</a> pgs 16-20)</td>
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<td>HW 44</td>
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<td>HW 44 – Density and Molar Mass determinations (<a href="#">Topic 5</a> pgs 21-25)</td>
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<td>HW 45</td>
<td>6:28</td>
<td>4/5</td>
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<td>HW 45 – Stoichiometry with Gases (<a href="#">Topic 5</a> pgs 26-27)</td>
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<td>HW 46</td>
<td>7:20</td>
<td>4/5</td>
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<tr>
<td>HW 46 – Partial Pressures (<a href="#">Topic 5</a> pgs 28-31)</td>
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<td>HW 47-48</td>
<td>4:43</td>
<td>4/5</td>
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<td>HW 47 – Collecting Gases over water (<a href="#">Topic 5</a> pgs 32-34)</td>
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<td>HW 48</td>
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<td>4/5</td>
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<td>HW 48 – Mole fraction (<a href="#">Topic 5</a> pgs 32-34)</td>
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<td>HW 49</td>
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<td>4/5</td>
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<tr>
<td>HW 49 – Kinetic-Molecular Theory &amp; Graham’s Law (<a href="#">Topic 5</a> pgs 35-40)</td>
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### Topic 6 – Thermochemistry

**PowerPoint:** [Topic 6](#)

<table>
<thead>
<tr>
<th>Video</th>
<th>HW (Duration)</th>
<th>Due Date</th>
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<tbody>
<tr>
<td>HW 50</td>
<td>6:28</td>
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</table>
HW 50 – Heat flow (Topic 6 pgs 1-10) Due 4/8
video: HW 51 (9:47)
HW 51 – First Law of Thermodynamics (Topic 6 pgs 11-16) Due 4/8
video: HW 52 (13:44)
HW 52 – Thermochemical Equations (Topic 6 pgs 17-20) Due 4/8
video: HW 53 (6:42)
HW 53 – Magnitude of heat (Topic 6 pgs 21-25) Due 4/8
video: HW 54 (7:29)
HW 54 – Magnitude of heat: calorimetry (Topic 6 pgs 26-29) Due 4/12
video: HW 55 (11:16)
HW 55 – Hess's Law (Topic 6 pgs 30-36) Due 4/12
video: HW 56 (10:31)
HW 56 – Standard Enthalpies of Formation (Topic 6 pgs 37-41) Due 4/12

EXAM III: Tuesday April 14 from 5:00-7:00pm (CST) on campus (C106)

Topic 7 – Quantum Theory of the Atom
PowerPoint: Topic 7
video: HW 57 (9:36)
HW 57 – Frequency and wavelength (Topic 7 pgs 1-7) Due 4/19
video: HW 58 (5:58)
HW 58 – Energy of photon (Topic 7 pgs 8-13) Due 4/19
video: HW 59 (11:57)
HW 59 – Bohr's Theory (Topic 7 pgs 14-26) Due 4/19
video: HW 60 (27:40)
HW 60 – Quantum Numbers (Topic 7 pgs 27-47) Due 4/19

Topic 8 – Periodic Properties of the Elements
PowerPoint: Topic 8
video: HW 61-62 (29:06)
HW 61 – Electron configurations (Topic 8 pgs 1-19) Due 4/22
HW 62 – Electron configurations - valance shell (Topic 8 pgs 1-19) Due 11/22
Topic 9 – Chemical Bonding and Lewis Structures
PowerPoint:  Topic 9

<table>
<thead>
<tr>
<th>Video</th>
<th>HW 63 (11:30)</th>
<th>HW 63 – Trends in Periodic Table (Topic 8 pgs 20-32)</th>
<th>Due 4/22</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video</td>
<td>HW 64 (6:57)</td>
<td>HW 64 – Lewis electron dot symbols (Topic 9 pgs 1-6)</td>
<td>Due 4/26</td>
</tr>
<tr>
<td>Video</td>
<td>HW 65 (23:41)</td>
<td>HW 65 – Polarity and Electronegativity (Topic 9 pgs 7-26)</td>
<td>Due 4/26</td>
</tr>
<tr>
<td>Video</td>
<td>HW 66 (26:28)</td>
<td>HW 66 – Lewis structures (Topic 9 pgs 27-45)</td>
<td>Due 4/26</td>
</tr>
<tr>
<td>Video</td>
<td>HW 67 (9:21)</td>
<td>HW 67 – Formal Charge and Bond Enthalpy (Topic 9 pgs 46-54)</td>
<td>Due 4/23</td>
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</tbody>
</table>

EXAM IV (HW 57-67): Tuesday April 28 from 5:00-7:00 (CST) via i-assign.com (HW 80)

Topic 10 – Molecular Geometry and Bonding Theory
PowerPoint:  Topic 10

| Video          | HW 68 (1:03:10) | HW 68 – VSEPR, hybridization, sigma/pi bonds (Topic 10 pgs 1-47) | Due 4/20 |

Topic 11 – Liquids and Solids
PowerPoint:  Topic 11

| Video          | HW 69 (41:43)  | HW 69 – Intermolecular force (Topic 11 pgs 1-48)               | Due 4/23 |

Topic 12 – Solutions
PowerPoint:  Topic 12

<table>
<thead>
<tr>
<th>Video</th>
<th>HW 70 (7:22)</th>
<th>HW 70 – Solubility (Topic 12 pgs 1-8)</th>
<th>Due 4/27</th>
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</thead>
<tbody>
<tr>
<td>Video</td>
<td>HW 71 (14:11)</td>
<td>HW 71 – Concentration units (Topic 12 pgs 9-18)</td>
<td>Due 4/27</td>
</tr>
</tbody>
</table>
Comprehensive Final (HW 1-74): Tuesday May 5 from 8:00-10.30am (CST) on campus (C106)

**Grading Policy:**

4-hour exams (100 pts per test) cumulative with emphasis on the material covered since last. These exams will be given on Feb. 11, **Tuesday March 14**, April 14, and April 28. The exams on Feb. 11 and April 14 will be given on campus. Exams on March 14 and April 28 will be given via i-assign.com (HW 77 and HW 80).

*Final Exam* – comprehensive exam worth 200 pts. Final Exam will be given on Tuesday May 5.

*Homework* – Homework will total 50 points (#points correct*50 / total points available). The homework assignments will be completed via Internet with due dates assigned on a weekly basis. 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: 0158, Course No. 5: SpringCHE133, your 4-digit student ID#: XXXX (see code at link: i-assign user codes), your student password: XXXXXXXX (your SFA student id#). First time you log in, please identify yourself on Main Menu screen and change password if you desire. **Code to access a particular homework assignment can be found within the YouTube lecture video for that assignment.**

*Method of Evaluation:* The final grade will be based upon percentage of points obtained in the following:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>exam 1</td>
<td>100 pts</td>
</tr>
<tr>
<td>exam 2</td>
<td>100 pts</td>
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<tr>
<td>exam 3</td>
<td>100 pts</td>
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<td>exam 4</td>
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<td>final exam</td>
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<tr>
<td>homework</td>
<td>50 pts</td>
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<tr>
<td>Total</td>
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</tbody>
</table>

**Grading scale** - A= 90 - 100%; B= 80 - 89%; C= 70 - 79%; D= 60 - 69%; F= below 60%

**Attendance Policy:**

This course is online – there are no required face-to-face meetings except for the required test dates. The exams will be given during the assigned times unless other arrangements are approved by the instructor prior to the scheduled exam day. There are no make-up exams for notifications given the day of the exam.

**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/.