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Department: Chemistry  
Email: afrantzen@sfasu.edu  
Website: www.faculty.sfasu.edu/  
Phone: (936) 468-2338  
Office: M 119  
Office Hours: MW 10:00-11:30am; MW 3:00-4:00pm; other times by appointment; if my door is open, I am generally available.

Class Hours: TR 9:30-10:50 pm; T 1:00-4:50 pm; W 12:00-1:00 pm

CATALOG DESCRIPTION: Laws, principles and theories concerning the structure of matter as related to properties.

PREREQUISITES: CHEM 1311, 1312, 3421; MATH 2313, 2314

CO-REQUISITES: CHEM 3037

REQUIRED TEXTS AND OTHER MATERIALS:
Lide, D.R. editor CRC Handbook of Chemistry and Physics
(The CRC can be any edition, but try to get an edition from the 2000’s-present)
Calculator with scientific notation

SUPPLEMENTARY MATERIALS:

COURSE GOALS: Students should learn the basic techniques, tools, and theories from the areas of Thermodynamics and Kinetics.

STUDENT OUTCOME OBJECTIVES:  
Upon completion of this course students will:
- Understand the need for the fields of Thermodynamics and Kinetics.
- Derive and apply the Laws of Thermodynamics.
- Derive and apply the laws governing the fundamentals of equilibrium.
- Understand the Kinetic Theory of Gases.
- Derive and apply equations explaining the rate of reactions.
- Derive mechanisms to explain rate equations.

COURSE CONTENT: Chapters from the text will be covered in the following order.
1 ZEROTH LAW OF THERMODYNAMICS AND EQUATIONS OF STATE  
2 FIRST LAW OF THERMODYNAMICS (EXAM 1)  
3 SECOND AND THIRD LAWS OF THERMODYNAMICS  
4 FUNDAMENTAL EQUATIONS OF THERMODYNAMICS (EXAM 2)  
5 CHEMICAL EQUILIBRIUM  
6 PHASE EQUILIBRIUM  
8 THERMODYNAMICS OF BIOCHEMICAL REACTIONS (EXAM 3)  
17 KINETIC THEORY OF GASES  
18 EXPERIMENTAL KINETICS AND GAS REACTIONS  
19 CHEMICAL DYNAMICS AND PHOTOCHEMISTRY  
20 KINETICS IN THE LIQUID PHASE (EXAM 4)  
7 ELECTROCHEMICAL EQUILIBRIUM (IF TIME PERMITS)
**COURSE REQUIREMENTS:** Exams will be given on **Thursday Evenings from 6:00-8:00 pm.** There will be a two hour time limit. The exams will be given September 21st, October 12th, November 2nd, and November 30th. The final exam will be held on Thursday, December 14, 2023, from 8:00-10:00am.

Grades for this course will be assigned in the following manner:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Laboratory</td>
<td>30%</td>
</tr>
<tr>
<td>4 Exams</td>
<td>40%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>20%</td>
</tr>
<tr>
<td>Homework/Quizzes</td>
<td>10%</td>
</tr>
<tr>
<td><strong>100%</strong></td>
<td></td>
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</tbody>
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**METHOD OF EVALUATION:**

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

**MAKE-UP POLICY:** There will be no make-ups in this class.

**ATTENDANCE POLICY:** Attendance is probably the single most important study aid in physical chemistry. As such, there is an attendance policy. Excused absences must be documented. The first two unexcused absences will not count against you. Upon the third unexcused absence, each absence will result in the removal of three percentage points from your final average.

**ABSENCE NOTIFICATION:**

There is a new policy for the process of absence notification for students. This is through the Dean of Students Office and should be handled as follows:

1. Students are responsible for submitting faculty notification requests and providing supporting documentation substantiating the reason for requests. Requests with no supporting documentation will automatically be denied.
2. SFA's Student Outreach and Support will review documentation and assess validity. Upon review, SOS will determine the approval or denial of the faculty notification request.
3. SOS will notify students of the faculty notification request determination and will notify faculty members only of approved faculty notification requests.
4. It is the student’s responsibility to provide approved faculty notification requests to faculty members. Additionally, it is at the faculty member's discretion to honor approved circumstantial requests.

**ACADEMIC INTEGRITY (A-9.1):**

The Code of Student Conduct and Academic Integrity outlines the prohibited conduct by any student enrolled in a course at SFA. It is the responsibility of all members of all faculty, staff, and students to adhere to and uphold this policy.

Articles IV, VI, and VII of the new Code of Student Conduct and Academic Integrity outline the violations and procedures concerning academic conduct, including cheating, plagiarism, collusion, and misrepresentation. Cheating includes, but is not limited to: (1) Copying from the test paper (or other assignment) of another student, (2) Possession and/or use during a test of materials that are not authorized by the person giving the test, (3) Using, obtaining, or attempting to obtain by any means the whole or any part of a non-administered test, test key, homework solution, or computer program, or using a test that has been administered in prior classes or semesters without permission of the Faculty member, (4) Substituting for another person, or permitting another person to substitute for one’s self, to take a test, (5) Falsifying research data, laboratory reports, and/or other records or academic work offered for credit, (6) Using any sort of unauthorized resources or technology in completion of educational activities.

Plagiarism is the appropriation of material that is attributable in whole or in part to another source or the use of one’s own previous work in another context without citing that it was used previously, without any indication of the original source, including words, ideas, illustrations, structure, computer code, and other expression or
media, and presenting that material as one’s own academic work being offered for credit or in conjunction with a program course or degree requirements.

Collusion is the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any provision of the rules on academic dishonesty, including disclosing and/or distributing the contents of an exam.

Misrepresentation is providing false grades or résumés; providing false or misleading information in an effort to receive a postponement or an extension on a test, quiz, or other assignment for the purpose of obtaining an academic or financial benefit for oneself or another individual or to injure another student academically or financially.

**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 coursework 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 to compute the grade point average. For additional information, go to [https://www.sfasu.edu/policies/course-grades-5.5.pdf](https://www.sfasu.edu/policies/course-grades-5.5.pdf).

**SEMESTER WITHDRAWALS:** Last day to withdraw from the course without obtaining WP or WF grade is December 5th.

**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 promptly may delay your accommodations. For additional information, go to [http://www.sfasu.edu/disabilityservices/](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. The student code of conduct can be found at: [http://www.sfasu.edu/policies/student-code-of-conduct-10.4.pdf](http://www.sfasu.edu/policies/student-code-of-conduct-10.4.pdf).

**RECITATION:** Recitation will be help on Wednesdays 12:00-1:00pm. During this time, we will work on problems from class and data crunching from the lab. It is mandatory to attend recitation.

**TIME REQUIREMENTS:** CHEM 3437 is a 4 credit course which meets for 150 minutes of lecture and 180 minutes of laboratory a week for 15 weeks. There is also a weekly 60 minute recitation to work problems and address any additional material. At the end of the semester there is a final exam. Students have significant materials to read and problem assignments that involve critical thinking and quantitative reasoning. Students are tested over the material throughout the semester and will be given a comprehensive final exam. Students should engage in a minimum of 9 hours (6 for lecture; 3 for lab) of work and study outside of classroom hours to prepare for and succeed in this course.
Tentative Schedule of Topics (Laboratory)

All experiment descriptions and protocols will be found on D2L.

- Gas Thermometry
- Heat Capacity Ratio of Gases (with modification)
- Heats of Combustion (Bomb Calorimetry, with modification)
- Heats of Ionic Reaction
- Solid-Liquid Equilibrium in a Binary System (with modification)
- Ionization Constants of Acids
- Kinetics

We will begin with the first four experiments. Partners will be assigned. For the second set of experiments (next two experiments) we will change partners, as we will for the last experiment. Each student will submit his or her own laboratory report. Laboratory reports will be due at the beginning of the next lab period after the experiment is completed. Late labs will be graded on a 70% scale if they are turned in the same day, and will not be accepted the next day. Your laboratory grade also depends on your laboratory techniques and etiquette. An additional requirement in lab is that the lab remains clean. I am not your mother and will not clean up after you. Failure to clean up your glassware and work area to my satisfaction will result in the removal of a minimum of 20% from everyone's grade. The format of the lab reports will be given and explained in detail before the first lab report is due. Students will be provided with the report format at the first recitation.

The schedule for labs will be as follows:

9/5-10/24  
During these weeks, you will finish the first four experiments. You have two weeks to finish each experiment, although some can be accomplished in one week. Each group will begin on a different experiment.

10/31-11/29  
During these weeks, you will finish the next two experiments. These experiments may take two weeks to finish.

12/5  
We will all be doing Kinetics at the same time. This experiment can be accomplished in one day.
COVID-19 INFO:
Campus has returned to normal operations. The updated campus protocols can be found at [https://www.sfasu.edu/covid19](https://www.sfasu.edu/covid19). Face coverings are not required but are suggested when found in public indoor settings. **A student running a fever should attend class via Zoom and should NOT attend a face to face class.**

MENTAL HEALTH:
SFA values students’ overall well-being, mental health and the role it plays in academic and overall student success. Students may experience stressors that can impact both their academic experience and their personal well-being. These may include academic pressure and challenges associated with relationships, emotional well-being, alcohol and other drugs, identities, finances, etc.

If you are experiencing concerns, seeking help, SFA provides a variety of resources to support students’ mental health and wellness. Many of these resources are free, and all of them are confidential.

**On-campus Resources:**
**The Dean of Students Office** (Rusk Building, 3rd floor lobby)
[www.sfasu.edu/deanofstudents](http://www.sfasu.edu/deanofstudents)
936.468.7249
dos@sfasu.edu

**SFA Human Services Counseling Clinic** Human Services, Room 202
[www.sfasu.edu/humanservices/139.asp](http://www.sfasu.edu/humanservices/139.asp)
936.468.1041

**The Health and Wellness Hub** “The Hub”
Location: corner of E. College and Raguet St.

To support the health and well-being of every Lumberjack, the Health and Wellness Hub offers comprehensive services that treat the whole person – mind, body and spirit. Services include:
- Health Services
- Counseling Services
- Student Outreach and Support
- Food Pantry
- Wellness Coaching
- Alcohol and Other Drug Education
[www.sfasu.edu/thehub](http://www.sfasu.edu/thehub)
936.468.4008
thehub@sfasu.edu

**Crisis Resources:**
- Burke 24-hour crisis line: 1.800.392.8343
- National Suicide Crisis Prevention: text 988
- Suicide Prevention Lifeline: 1.800.273.TALK (8255)
- jhCrisis Text Line: Text HELLO to 741-741