Chem 331 **Course Overview** **Fall 2020**

Physical Chemistry I

Instructor	Prof. Tom Trainor
Office	REICH 176, Tel: 474-5628
Email	tptrainor@alaska.edu
Class meeting	Lectures will be posted on blackboard.
Lab	Tuesday 11:30 – 2:30
Office hours	By appointment.
Text	Atkins, DePaula and Keeler, Physical Chemistry 11th Edition

Course Overview: Chemistry 331 is the first semester of a two-semester series in physical chemistry. The course will cover principles of thermodynamics and kinetics with applications to phase equilibria, solutions, chemical equilibrium and electrochemistry.

Prerequisites: CHEM F106X, MATH F252X, PHYS F124X or PHYS 212X.

Learning Outcomes: At the end of the course students will have an understanding of thermodynamic and kinetic principles, their mathematical development, and application to chemical problems.

Course structure: The course primarily follows your text, in the order described in the attached schedule of topics. During Monday and Wednesday classes I will lecture on the material in the book. Reading the book before the lectures will be important for following and understanding the lectures. The Friday classes are a combination of lecture and in-class quizzes. These Friday quizzes are an important part of the course as they will help you to stay current with the course material. This course also has a laboratory section to give examples of in-class concepts.

Exams, Quizzes, & Grading: Your course grade will be based on the total points of the regular exams, the final exam, the quiz scores, and possibly extra credit exercises. Material assigned in readings, in lecture, or in homework problems may appear on an exam. The maximum number of points for each is given below:

Exams (100 pts each)	300
Final exam	100
Quizzes	100
Labs	150
Total	650

Make-up exams will be allowed if you have a good reason. If you anticipate an absence (work commitments, intercollegiate sports), talk to me **before** the exam to make arrangements. If the absence is unexpected (illness, family or personal difficulties), *talk with me at the earliest possible opportunity*. Students with documented disabilities who may need reasonable academic accommodations should discuss these with me during the first two weeks of class. You will need to provide documentation of your disability to Disability Services in the Center for Health and Counseling, 474-7043, TTY 474-7045

Homework: Homework and quizzes are a critical aspect of learning physical chemistry. Every week you will be assigned homework exercises. These are not graded (you do not have to turn them in), and you will be provided with answer keys. If you attempt a problem but don't get an answer, see me for help. A few of these exercises are selected to improve your mechanical skills and also help you to find the right formula to apply to a problem. Many of the problems will be conceptual in nature. These questions should reinforce topics covered in lecture and provide examples of how the concepts are applied for problem solving.

Quizzes: Short quizzes will be given weekly. These will be posted at a specific time and you will be given a time limit in which to complete it. The purpose of the quiz is to provide a frequent check on learning progress. Doing the homework diligently is the best way to assure good grades on the quizzes, and past experience has shown that good quiz grades translate to good course grades. There will be no makeup quizzes, but your two lowest quiz grades will be dropped.

Exams: The exams will be take-home, they will be posted at a specified time and you be given a time limit to complete. The tentative exam dates are:

Exam	**Material Included**	**Tentative Date**
1	Weeks 1-4	25-Sep
2	Weeks 5-7	16-Oct
3	Weeks 8-11	13-Nov
Final	Approximately 50% weeks 12-15, 50% cumulative	11-Dec, 8:00am

Tentative Grade Scale. If you get at least 90%, you are guaranteed an "A". I may elect to set the grade cutoffs lower, but we will not set them higher.

Grade	Percentage
A	90
B	80
C	70
D	60

Important Dates:

Sept 4 – Deadline for late registration
Sept 4 – Deadline for drop
Oct 30 – Deadline for withdrawal

Required UAF COVID Statement

Students should keep up-to-date on the university's policies, practices, and mandates related to COVID-19 by regularly checking this website: https://sites.google.com/. Further, students are expected to adhere to the university's policies, practices, and mandates and are subject to disciplinary actions if they do not comply.

Tentative Schedule of Topics:

Week	Chapter	Topic
1	1	Gases (ideal and real)
2	2	Heat, work, and internal energy. First law.
3	2	Enthalpy, thermochemistry and state functions
4	3	Second law, entropy and direction of spontaneous change
5	3	Entropy and Gibbs energy
6	4	Phase transitions of pure substances
7	5	Simple mixtures
8	5	Phase diagrams, non-ideal solutions, activities
9	6	Equilibrium
10	6	Equilibrium electrochemistry
11	16	Diffusion and transport properties
12	17	Chemical kinetics
13	17, 18	Kinetics and reaction dynamics
14	18	Reaction dynamics (**Thanksgiving)**
15		Final review