Physical chemistry is the branch of chemistry that establishes and develops the principles of chemistry in terms of the underlying concepts of physics and the language of mathematics. This course is the first part of a two-part series of physical chemistry, the foundation course. In the foundation part, we will cover primarily Thermodynamics, Kinetics, with a brief introduction of Quantum Theory. Thermodynamics deals with energy and work in chemical systems, and determines equilibrium of chemical processes. Kinetics is a study of rate processes, in particular, chemical reactions. Together thermodynamics and kinetics determine which chemical/physical/biological processes are possible, and how fast (if at all) they occur.

The following chapters from the text will be covered:

Chapter 1 The properties of gases
Chapter 2 Thermodynamics: the first law
Chapter 3 Thermodynamics: applications of the First Law
Chapter 4 Thermodynamics: the Second Law
Chapter 5 Physical equilibria: pure substances
Chapter 6 The properties of mixtures
Chapter 7 Chemical equilibrium: the principles
Chapter 9 Chemical equilibrium: electrochemistry
Chapter 10 Chemical kinetics: the rates of reactions
Chapter 11 Chemical kinetics: accounting for the rate laws
Chapter 18 Solid surfaces, including materials on heterogeneous catalysis, electrochemistry
Chapter 12 Quantum theory
Important dates:

Aug. 24: First Class
Sept. 7: Labor Day Holiday, no class
Sept. 28: First Exam (Chap. 1-4)
Oct. 12: Fall Break, no class
Oct. 23 or Oct. 26: Second Exam (Chap. 5-7,9)
Nov. 11, Veterans Day Holiday, no class.
Nov. 30: Third Exam (Chap. 10-11, 18)

Nov. 25, 27: Thanksgiving Vacation, no class
Dec. 11: Last day of class
Dec. 18: Final Exam 12:30-2:30 pm (Comprehensive)

You should come to the class prepared; read the text in advance. The publisher’s web site has some helpful exercises that help you to digest and grasp the concepts. You are encouraged to register at the site and explore those applications. Your active participation in the class is encouraged! Questions and suggestions are always welcome. In addition to the 3 mid-term exams, I will also give several unannounced quizzes (~15 mins) between the exams.

Attendance
Attendance in class is expected. You are responsible for obtaining materials covered in missed lectures. Absenteeism hurts homework and test performance.

Exams may be made up if I am notified within 24 hours of the missed exam, and you should provide a simple written explanation why you missed the exam (personal details are not required, but excuses must be legitimate).

Homework
Homework helps to understand and solidify the concepts that you learned in class. Learning to solve problems is the most important part of this course!

Every week several homework problems will be assigned from your textbook. Supplementary problems will be provided from time to time. Homework problems are due in one week, at the start of the class. Late homework will not be accepted. I will check the completeness of the assigned homework but will not grade every one. Homework solutions will be posted on-line at D2L. Homework counts 10% towards your final grade. You should work with your classmates on homework problems but I expect each student hands in his/her own homework. Please include the names of your study group partners if you have done so.

Exams
Three Exams are worth 15% each; Final Exam is worth 30%. Exams are closed-book and closed-notes, and you work alone. You will be provided with sufficient information about equations and constants to be used. Bring your own calculator to the exams.

Important: Make sure to complete the problem that you know how to work with and attempt all problems. Some credit will be given for incomplete solutions.
**Summary of Grading Policy**

I grade the exams using the clustering approach. You will get a percent point as well as a letter grade for each exam.

Final grade (100%) will be calculated based on three Mid-term exams (15%*3 =45%) and Final Exam (30%), Quizzes (15%), Homework Problems (10%).