# Chemistry 25 (3-0-6)
# Spring Term 2017
# Introduction to Biophysical Chemistry
**4/4/17**

Chemistry 25 develops the basic principles of thermodynamics, transport and kinetics, with emphasis on biochemical and biophysical applications.

**Instructor**
Douglas C. Rees, dcrees@caltech.edu, 363 Broad, ext. 8393

**Teaching Assistants**
Belinda Wenke, bwenke@caltech.edu, office hours TBA
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**Class Hours**
Ch 25 meets Tuesday and Thursday from 1:00 - 2:25 pm in 147 Noyes.

**Text**
A set of lecture notes posted on the course website will serve as the primary Ch25 text. Two useful texts that have served as the course text in the past are on reserve in SFL;
D. Eisenberg and D. Crothers (EC) “Physical Chemistry with Applications to the Life Sciences” Benjamin Cummings (1979).
J. Kuriyan, B. Konforti and D. Wemmer (KKW) "The Molecules of Life: Physical and Chemical Principles" Garland Science (2013).
A selection of additional, more specialized biophysics text are also on reserve.

**Ch25 Website**
Problem sets, answer keys and other useful material for this course may be found at: http://www.br.caltech.edu/reesgrp/courses/ch25.html.

**Grading**
There will be a midterm and a final examination. Your final grade will be based on homework (30%), midterm exam (35%), and the final exam (35%).

All assignments, including all problem sets, must be turned in to pass the course.
**Show your work!** Getting the right answer is not enough – the intermediate steps are needed for full credit.

Unless otherwise announced, assignments will be due in class by Thursdays at 1 pm. Late assignments will be accepted with the following penalties:
25% if received by 1 pm the next day (Friday).
50% if received by 1 pm the following Monday.
75% if received by 1 pm the following Tuesday.
100% after 1 pm the following Tuesday. Assignments received after this time must score at least as high as the class average to be credited as completed.

**Problem Sets**
Homework sets will be posted to the Ch 25 website by Thursday afternoon and are due one week later in class on Thursday at 1:00 p.m. Answer keys will typically be posted on the Ch 25 website by the following lecture. Changes to this schedule (should they occur) will be announced in class and on the course website. Please staple all work.

Problem Set 7: Caltech hosts a variety of seminars in biophysics and related areas. For PS 7, attend one of these seminars and write a 1 page summary (double-spaced) due the last day of class (Thursday, June 1).

**Late Exam Policy**
Excuses for late exams must be arranged in advance with Dr. Rees. Unexcused late exams will be penalized as described below. Medical excuses will only be accepted with a note signed by a medical doctor. Having too much work in other classes is not a valid excuse.

**Collaboration Policy**
Students are encouraged to cooperate on the homework; however, outright copying of solutions to the homework problems from another student, textbook, material from any previous years of Ch 25 or Ch 24 (the precursor to Ch 25), etc. is **NOT** permissible. Each individual is expected to personally complete the homework he/she hands in and she/he should be able to explain the homework handed in.

The examinations must be taken individually and without discussion among students.

**Ombudsperson Meeting**
A student ombudsperson will be chosen to serve as a liaison between the class and the Chemistry Executive Officer (Dr. Reisman) and the Chemistry Curriculum and Undergraduate Studies Committee Chair (Dr. Okumura). If you have any comments, complaints or suggestions about the course, you should relay them to the class ombudsperson. However, given the timing of these meetings, it is unlikely that this feedback will be received by the instructor in a timely fashion to improve the course. **Therefore, please feel free to see Dr. Rees at any time to discuss any issues related to this course.**

**Ch25 Class Schedule Spring 2017**

**HO** = Homework handed out, **HD =** Homework due

Reading assignments for online course lecture notes

schedule subject to change with notice

| date | topic | assignments |
|---|---|---|
| **week 1** | **1st and 2nd Laws of Thermodynamics** | Ch. 1 |
| April 4 | | HO-7 |
| April 6 | | HO-1 |
| **week 2** | **Probability and Entropy** | Ch. 2 |
| April 11 | | |
| April 13 | | HD-1, HO-2 |
| **week 3** | **Free Energy and Equilibrium** | Ch. 3 |
| April 18 | | |
| April 20 | | HD-2, HO-3 |
| **week 4** | **Ideal and Real Solutions** | Ch. 4 |
| April 25 | | |
| April 27 | | HD-3 |
| **week 5** | **Electrolytes Solutions** | Ch. 5 |
| May 2 | **and Electrostatics** | |
| May 4 | | **midterm out** |
| **week 6** | **Ligand Binding and Cooperativity** | Ch. 6 |
| May 9 | | |
| May 11 | | **midterm due** HO-4 |
| **week 7** | **Oxidation-Reduction Processes** | Ch. 7 |
| May 16 | | |
| May 18 | | HD-4, HO-5 |
| **week 8** | **Diffusion and Transport Processes** | Ch. 8 |
| May 23 | | |
| May 25 | | HD-5, HO-6 |
| **week 9** | **Biochemical Kinetics** | Ch. 9 |
| May 30 | | HD-6 |
| June 1 | | HD-7+**final out** |
| **week 10** | **Review** | |
| June 6 | review | |
| June 8 | | **final due** |