

Physical Biochemistry, BCMB 4110/6110

Fall Semester 2006

Monday, Wednesday, Friday: 10:10-11:00 a.m.

Instructors: Ron Orlando and James Prestegard

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8/16 to 10/4: Chemical and Enzyme Kinetics, Orlando

8/16	Introduction	238-245
8/18	Zero and First Order Reactions	249-251
8/21	Second and Higher Order Reactions	253-254
8/23	Determining Rate Laws 1	247-249
8/25	Home Work Review	
8/28	Consecutive Reactions	270-272
8/30	Complex Reactions, and Approximations	273-275
9/1	Real Reactions, and Temperature Dependence	256-258
9/4	- holiday	
9/6	Examples of Real World Kinetic Data	252, 259,
9/8	Home Work Review	
9/11	- Exam 1	
9/13	Introduction to Enzymes	
9/15	Michaelis-Menten Mechanism	309-312
9/18	Interpreting Enzyme Kinetic Data	313-316
9/20	Enzyme Inhibition	317-320
9/22	Electron Transfer Reactions	320-328
9/25	Home Work Review	
9/27	Kinetics of Separations	303-306
9/29	To be announced	
10/2	To be announced	
10/4	- Exam 2	

10/6– 12/6: Thermodynamics and Molecular Structure Prestegard

10/6	state functions and equations of state	7-14
10/9	the first law and enthalpy	27-56
10/11	entropy and Gibbs free energy	77-97
10/13	phase equilibria	104-119
10/16	chemical potential and colligative properties	120-138
10/18	chemical equilibria	151-164
10/20	pH and buffers	169-191
10/23	enzyme inhibitors and drug design	-----
10/25	- Exam 3	
10/27	- fall break	
10/30	electrochemical potential and ion transport	200-207

11/1	redox reactions and the Nernst equation	208-222
11/3	electron transport and bioenergetics	223-230
11/6	principles of quantum theory	340-347
11/8	simple electronic models - particle in a box	350-361
11/10	many electron systems	364-380
11/13	electronic structure of biomolecules	394-413
11/15	- Exam 4	
11/17	molecular interactions	458-469
11/20	macromolecular structure and modeling	427-447
11/22	- holiday	
11/24	- holiday	
11/27	relating molecular energetics to thermodynamics	502-509
11/29	Statistical thermodynamics	510-524
12/1	electronic spectroscopy and fluorescence	562-576
12/4	magnetic resonance in biology	604-626
12/6	microscopy	-----
12/8	- final exam (8-11 AM)	

Exams:

A total of 4 in-class exams will be given (2 on kinetics and 2 on thermodynamics). Each exam will count for 20% of your final grade.

FINAL EXAM: 20% of final grade. The final exam will be comprehensive, covering all lecture material presented in this course.

Grades on each exam will be "curved" upwards so that the average score is a 75.

Grades:

A 90+
B 80-89
C 70-79
D 60-69
F <60

Text:

Physical Chemistry for the Life Sciences, Atkins and de Paula.