

Spring 2005

Chemistry 423B
GENERAL BIOCHEMISTRY

Instructor: Dr. Bruce Weber – MH-504A (714) 278-3885; bhweber@fullerton.edu

Office Hours: MW 2:30 – 3:30 PM, TR 1:30 – 2:30 PM, F 10 - 11 AM

Texts: Voet and Voet **Biochemistry** 3rd edition; Weber Chem 423B (class notes and readings) [R]

Class meeting	Date	Topic	Reading Assignment
1	1/31	Unit 1: Bioenergetics Introduction; review of energy metabolism	566-571
2	2/2	Pentose Shunt	862-868
3	2/4	Biological redox reactions	571-577; 802-805; [R] 1, 2, 4
4	2/7	Membrane Transport	726-750; [R] 3
5	2/9	Oxidative Phosphorylation and electron transport	805-820; 833-838
6	2/11	Quiz 1 (redox, transport): Ox-phos mechanism	820-822; [R] 5-25
7	2/14	Chemiosmotic theory	822-827; [R] 21-45
8	2/16	ATP Synthesis and utilization	827-833
9	2/18	Quiz 2 (ox-phos, chemiosmotic calculation) Photosynthesis: Light reactions	871-896
	2/21	Holiday	
10	2/23	Photosynthesis: dark reactions	896-903; [R] 52
11	2/25	Dark reactions, C4 cycle; review of unit 1	903-906
12	2/28	EXAM 1 (over lectures 1-11)	
13	3/2	Unit 2 Lipid Metabolism – Fatty acid oxidation	909-919; [R] 53-54
14	3/4	Fatty acid oxidation (unsaturated, odd carbons)	919-928
15	3/7	Ketone bodies; fatty acid oxidation calculations	928-930; [R] 55-60
16	3/9	Fatty acid biosynthesis	930-942; [R] 61
17	3/11	Quiz 3 (fatty acid oxidation) cholesterol biosynthesis	942-954; [R] 62-63
18	3/14	Cholesterol metabolism	439-449, 954-959; [R] 64
19	3/16	Prostaglandins	959-969
20	3/18	Quiz 4 (lipid biosynthesis) phospholipids, glycolipids	969-976
21	3/21	Diseases of lipid metabolism; review of unit 2	977-979
22	3/23	EXAM II (over lectures 13 – 21)	
23	3/25	Unit 3 – amino acid metabolism: overview;	985-991, Fig. 26.11 on

		<i>pyridoxal phosphate chemistry</i>	p. 995
		SPRING BREAK 3/28 – 4/3	
24	4/4	Urea Cycle	991 - 995
25	4/6	Quiz 5 (PLP Chemistry) amino acid catabolism of C3 and C4 amino acids	995 – 1000
26	4/8	Amino acid catabolism: C5	1000 – 1003
27	4/11	Amino acid catabolism: paths to succinyl CoA, acetoacetate	1003 – 1007
28	4/13	Amino acid catabolism: aromatics	1007 – 1013
29	4/15	Quiz 6 (amino acid catabolism): amino acid biosynthesis: overview, folate metabolism, N2 fixation	1027 – 1038, 1044 – 1049; [R] 69-73
30	4/18	Amino acid biosynthesis: aspartate family	1039 and 1041
31	4/20	Amino acid biosynthesis: Pyruvate family; aromatics	1040 and 1041 – 1044
32	4/22	Quiz 7 (amino acid biosynthesis) metabolism of hemes	1013 – 1024
33	4/25	Metabolism of biogenic amines; Review of unit 3	1024 – 1027
34	4/27	Unit 4 – Nucleotides; regulation and integration of metabolism: purine biosynthesis	1069 – 1076
35	4/29	EXAM III (over lectures 23 -33)	
36	5/2	Pyrimidine biosynthesis	465 – 470, 1076 – 1080
37	5/4	Quiz 8 (nucleotide metabolism) formation of deoxyribunucleotides; nucleotide catabolism	1080 – 1101
38	5/6	Glycogen Metabolism and hormonal regulation I	626 – 635
39	5/9	Glycogen Metabolism and hormonal regulation II	635 – 654
40	5/11	Signal Transduction	657 – 720
41	5/13	Quiz 9 (glycogen metabolism) Integration of metabolism, metabolic regulation	1054 – 1067; [R] 74 – 77
42	5/16	Clinical Case Studies I	[R] 78 – 95
43	5/18	Clinical Case Studies II	[R] 96 – 107
44	5/20	Clinical Case Studies III and general review	[R] 108 – 114
45	5/25	Final Examination (comprehensive 9:30 – 11:30)	

COURSE POLICIES

1. Reading assignments are TO BE READ PRIOR to the scheduled lecture.
2. QUIZZES will be no more than 10 minutes long and will be given at the beginning of the designed class meeting. Your lowest quiz score will be dropped.

3. Examinations will be done on the scheduled days and there will be no makeup exams except in extenuating circumstances and by prior arrangement with the instructor. If our final grade divided by two is higher than your lowest exam score, then the higher number will be substituted.
4. Homework will be assigned and graded and scaled to 20 points maximum. Some additional homework may be assigned but not collected. There may be one or two extra credit assignments.
5. Grading will be primarily on the basis: 81% < A < 100%; 65% < 80%; 45% < C < 64%; 30% < D < 44%
6. Grade breakdown:

3 examinations	300 points
Final Examination	200 points
Quizzes	80 points
Homework	20 points

COURSE OBJECTIVES

1. Master the factual structural, chemical and conceptual material in texts and lecture and understand molecular logic.
2. Develop creative ability to apply your knowledge to novel situations and to solve problems.
3. Develop critical ability to evaluate biochemical experiments in terms of experimental design, the principles and limitation of techniques available, and quality of data.
4. Learn that biochemistry, as all science, is a modeling process and to understand the relationship of facts and data, models and theories.
5. Learn that biochemistry represents a way of knowing about and a language for describing that part of living phenomena that can be understood in molecular terms. As in learning any new language you will have to know vocabulary (structures, reactions) and grammar (biochemical concepts and principles).
6. See how biochemistry relates to phenomena at other levels of the biological hierarchy and thereby illuminate such phenomena and provide the basis for practical applications in the medical and agricultural sciences.