

C365 Biochemistry Syllabus & Policies for Fall 2017

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A. Instructor's schedule:

	Monday	Tuesday	Wednesday	Thursday	Friday
08:00		C365 A109	C365 Lab 1 D118	C365 A109	C365 A109
09:00					
10:00				Office Hours	
11:00	Office Hours	Office Hours			
12:00					
13:00					
14:00	C105 Lab 1LA B140	C365 Lab 2 D118	C365 Lab 3 D118		Dept. Business
15:00					
16:00					

***Office hours:** Except for unusual circumstances, I will always be available to help you during the office hours posted above. If necessary, please schedule to meet with me for help at other open times on my schedule.

B. Objectives, prerequisites & required materials: C365 is designed to introduce students to the “molecular logic” that is common to all living systems & the course is divided into three broad themes: (1) The structure & building block composition of three of the four major classes of biomolecules (polysaccharides, proteins, & lipids) as well as an introduction to the properties & functions of these large macromolecules; (2) an introduction to both cellular thermodynamics (bioenergetics) & enzyme catalyzed (cellular) reactions; and finally, (3) the central metabolic pathways of sugar and lipid catabolism. Due to the time restrictions of this one-semester course, many foundational topics in biochemistry are intentionally omitted, in particular: (1) photosynthesis; (2) the nitrogen cycle; & (3) the storage and expression of genetic information as outlined by the central dogma of molecular biology. Several of these topics are, however, introduced in other courses offered at UWSP, including both Cellular Biology (B314) & Molecular Biology (B318/19 or B320).

All prerequisite courses (or equivalent transfer credits) **must be completed prior to enrollment.**

- General Chemistry (C105/106 or C117).
- Quantitative Analysis (C248).
- Organic Chemistry (C325 and C326).

Required Textbook: *Principles of Biochemistry with a Human Focus* (First Edition), by Garrett and Grisham; Brooks/Cole Publishing; 1997. (Available for rental from the university bookstore).

Laboratory Manual: *Instructions for C365 Lab Exercises* compiled by the UWSP Biochemistry faculty is available for purchase from the university bookstore.

C. Grading scale and exam schedule:

Letter grades are assigned based upon the percentage of the total 1130 points accumulated from four lecture exams (200 points each, 800 points total), one lab quiz (30 points), & nine graded laboratory reports / exercises (300 total points) according to the following grading scale:

Percentage of total points	Minimum grade	Percentage of total points	Minimum grade
Over 90%	A	77 to 79%	C+
88 to 90%	A-	72 to 77%	C
86 to 88%	B+	68 to 72%	*C-
81 to 86%	B	64 to 68%	D
79 to 81%	B-	Below 64%	F

***NOTE** Upon request by email prior to the final exam, a letter grade of C- may be changed to a D+!

Exam dates and times:

*Exam 1 (week 5): Monday, Oct. 2nd, 2017 (7-8:30 PM in A107 . . . not A109).

Chapters: 1, 2, 4, 5, & 7 (& related laboratory exercises).

*Exam 2 (week 8): Thursday, Oct. 26th, 2017 (7-8:30 PM in A107 . . . not A109).

Chapters: 6, 8, 14 & 3 (& related laboratory exercises).

*Exam 3 (week 12): Mon, Nov. 20th, 2017 (7-8:30 PM in A107 . . . not A109).

Chapters: 10, 14, 15, 16 (& related laboratory exercises).

Exam 4 (week 16): Monday, Dec. 18th, 2017 (8-10:00 AM in A109).

Chapters: 17, 19, 20, 12 (& related laboratory exercises).

Quiz (week 11 lab period):

Structures of the Central Intermediates of Metabolism.

D. Prompt Attendance to all class meetings is expected. You are responsible for all material missed due to any excused or unexcused absence. UNLESS a specific arrangement is made in advance of an absence, no makeup credit will be provided for missed exams or labs.

E. Electronic devices Please remember to silence all cell phones prior to each class meeting. During exam periods, cell phones are not an appropriate replacement for a dedicated calculator!

F. Accommodations for disabilities: Students should contact the Office of Disability Services within the first two weeks of the semester in order to request and arrange necessary accommodations for exams and laboratory assignments.

G. Academic Responsibility: While I encourage students to work & study in-groups, projects submitted for grading must reflect your work, your effort and your understanding of the material. Academic dishonesty will be dealt with in accordance to the UWSP rules on academic misconduct as stated in Chapter 14 of the Rules and Regulations Governing the Faculty, Staff, and Students of the current UWSP handbook.

C365 Fall 2017: Tentative lecture schedule (& related chapters)

Wk	Tuesday	Thursday	Friday
1	(1) Key Cell Biology concepts (2) Lab Lecture: Review of IMF's & acid-base equilibrium	O-Chem Review: Lewis structures of common functional & linkage groups.	(7) An introduction to monosaccharides & stereoisomer review.
2	(7) Common monosaccharide reactions: α vs. β anomers & mutarotation.	(7) Wrap up: common monosaccharide reactions. Disaccharide structures	(7) Polysaccharides & branching analysis
3	(4) Amino acid structures, properties & classification.	(4/5) Wrap up amino acids. Start protein overview (parts 1 & 2)	(4/5) Finish protein overview (parts 2 & 3)
4	(4/5) The 4-levels of protein structure with emphasis on secondary structures .	(5) Wrap up protein structure: denaturants and separation strategies.	(6) Lipid Overview: Properties classification.
5 Ex 1	(6) Fatty acids, vegetable oils & membrane lipids.	(6) The Fluid Mosaic Model of Membrane Structure: Movement & sidedness	(6) Membrane transporters: classification & energetics.
6	(6) Wrap up of lipids & membrane transport.	(8) Nucleotides: composition & cellular reactions. (14) Dinucleotides & CoASH	Wrap up Nucleotides & dinucleotides
7	(3) Review: 1 st & 2 nd laws of Thermodynamics & Nernst equation.	(3) The role of ATP in the phosphate cycle of bioenergetics.	(3) Wrap up the phosphate cycle & bioenergetics.
8 Ex 2	(10) Review: chemical kinetics, & rate enhancements. Enzymes vs. industrial catalysts	(10) The transition state theory of enzyme catalysis & effects of T, pH, [E], & [S] on E. kinetics.	(10) Continuation of enzyme kinetics.
9	(10) Enzyme inhibition and regulation.	(10) Classification and nomenclature of enzyme reactions.	(14) The central metabolic pathways: an overview.
10	(15) Glycolysis: The priming phase (steps 1-5).	(15) Glycolysis: The pay-off phase (steps 1-6) (16) The PDHEC	(16) Wrap up PDHEC & start the Krebs's cycle reactions
11 Lab quiz	(16) Wrap up Krebs cycle & summary of the central reactions.	(17) An overview of chemiosmotic coupling (ATP biosynthesis).	(17) The Electron Transport Chain (ETC).
12 Ex 3	The Fo/F1 ATPase and oxidative phosphorylation	Thanksgiving Break No Class	
13	(17) Chemiosmotic coupling: ATP yields & drug classification	(17) Wrap up chemiosmotic coupling. (15) Fermentation.	(19) The Cori cycle and gluconeogenesis.
14	(19) Phosphogluconate pathway & Glycogen metabolism.	(19) Reciprocal control of futile cycles & overview of fat utilization.	(20) Lipid utilization: mobilization, activation, mito. Shuttle & β -oxidation.
15	(20) ATP yield from fatty acids (summary). Lab lecture (12): Serum lipoproteins (lipid transport).	(12) Ketone bodies and ketosis.	Question & answer period No new lecture material

Exam 4: Chapters 17, 19, 20, 12

Monday Dec. 18th, 2017 (8:00 to 10:00 AM, A109).