

Biochemistry I Lecture & Lab Schedule

BI/CH421 & BI/CH621 – Section A1

Fall 2020 (version 7)

Staff	Phone	Office	E-mail	Office Hours
Dr. Dean Tolan	3-5310	Rm 704, 24 Cummington (LSE)	tolan@bu.edu	R/F 3:30–4:30, or by arrangement (Zoom or in LSE-704)
For BI-labs: Dr. Jose Medrano (BI Lab Coordinator)		SCI 428 (590 Commonwealth)	medrano@bu.edu	M 5:30-7:30, R 4-6
For CH-labs: Dr. Vardar-Ulu (CH Lab Coordinator)		SCI 358A	dvardar@bu.edu	M 2-3, T 10:30-11:30 & F 2:15 pm-3:15 (SCI 162 for skills)
For the laboratories: (BI-only in red; CH-only in green, and both in purple)				

Sections	Times	Places
Lecture	M 8:00 AM; W 9:05 AM; & F 9:05 AM (all end at 9:55 AM)	SCI 109
Pre-lab Disc.	§For W/R BI-labs: (C1) M 12:20 PM (CAS 233); (C2) T 5:00 PM (STO B50). For F/M/T BI-labs: (C3) W 2:30 PM (CAS 233); (C6) R 9:00 AM (TBA) For R/F CH-labs: (C4) W 10:10 AM (YAW 613A); (C5) W 12:20 AM (BCN 115).	
Laboratory	(B1, B2, B3) W 8:00, 1:25 & 6:30 (B4, B5) R 8:00, 3:30 & 6:30 (B6, B7) F 10:10 & 3:30 (B8, B9) M 11:15 & 4:30 (BA) T 8:00 AM (CH labs in green) (BI labs in red)	SCI 162
621 Discussion (Grad students)	TBA	TBA

Date	Lecture #	Topic	Reading in Lehninger	Problems*	Laboratory
W-Sept 2	0	Organization & Introduction	Ch1, 1-5, 12-14	review orgo;	Discussions begin LAB STARTS
R-Sept 3					
F-Sept 4	1	- Introduction, thermodynamics	Ch1, 8-11, 15-16, 21-27 Ch13, 496-497	1,2,3,4,7 1,2,3,4	
		- Water & Hydrogen Bonds	Ch2, 47	3; 1,2	
M-Sept 7		HOLIDAY – Labor Day			Discussions begin LAB STARTS/Chapter 1
W-Sept 9	2	- Molecular Forces	Ch2, 47-58	1,2; 3,4,5,6,7	Module 1 (Ch2)
F-Sept 11	3	- pH	Ch2, 58-68	5,6,9,11,14,15,17,20,22, 24,29,35	
		– National Patriot Day			
M-Sept 14	4	- Proteins; Introduction	Ch3, 75 Ch1, 16-20 Ch4, 115-116	– 11,13,16 12	
		- Amino Acids I-structure & properties	Ch3, 75-82	1,6; 1,2,3	
W-Sept 16	5	- Amino Acids II pH	Ch3, 82-87; 92-94	2,3,4,7,11,12; 4,5,6,8,9	Chapter 2/Module 2 (Ch1)
		- Amino Acids III pI	Ch2	34	(Ch 1 due)
F-Sept 18	6	- Protein Purification	Ch3, 89-93, 95-96 Ch1, Fig 1-9 Ch9, 332-333	9,10,14,15,22 9 –	
Sun-Sept 20		Review Session via ZOOM (time TBA)			
M-Sept 21		HOURLY EXAM I (8:00-10:00 AM) [Lectures 1-6] (7)			
W-Sept 23	7	- Protein Structure I: Primary (1°)	Ch3, Fig 3-23 Ch4, 117-119	5,8,17,21 1,5,6,12	Ch 3; A,B,C (Module 3A) (PostLab 1 due)
F-Sept 25	8	- Protein Structure II: Determination of 1°	Ch3, 97-102 Ch4	18,19,20,23; 9 3	
M-Sept 28	9	- Protein Structure III: 2° the α -helix	Ch4, 119-122, 125-126, 131-133	2,3,4,8	
		- Protein Structure IV: 2° the β -sheet;	Ch4, 123-124, 130-131, 133, 137-138	13,14	
W-Sept 30	10	- Protein Structure V: 3° & 4°	Ch4, 125, 138-141, 141-142	7,9,11; 1,2	Chapter 3; D,E (Module 3B) (Ch2 due) (PostLab 2 due)
F-Oct 2	11	- Protein Structure VI: Characterization of Proteins; Determination of 2°, 3°, 4°	Ch4, 134-136 Ch4, 125 (Fig 4-10)	10,15	
M-Oct 5	12	- Protein Structure VII: Collagen	Ch4, 127-130		
		- Enzymes I; intro., binding & catalysis;	Ch1, 27-29 Ch5, 157-158, 160-161, 166bot.	16 1,4,5,6; 6	
			Ch6, 219		
W-Oct 7**	13	- Enzymes II; enzyme nomenclature; mechanism nomenclature (Cleland)	Ch6, 187-189 Ch6, 204-205	3,5,6; 1	Chapter 3; F, G (Module 3C) (PurifTable due)
		transition-state theory, catalytic strategies	Ch6, 190-191, 194-195	2,7; 13,22	
F-Oct 9		Review Session in SCI 109			
M-Oct 12		HOLIDAY – Columbus Day			
T-Oct 13 (Mon Sched)		HOURLY EXAM II (8:00-10:00 AM) [Lectures 7-13; 1†] (9)			BA lab rescheduled
W-Oct 14	14	- Enzymes III; mechanistic strategies	Ch6, 197-198	24; 4	Chapter 11 & 3 (finish)
		Steady-state kinetics;	Ch6, 198-203	8,9,10,11,12,13,14; 1; 16-21 (Module 3D (Ch 5B))	(PostLab 3 due)
F-Oct 16	15	- Enzymes IV; data analysis	Ch6, Box 6-1	15,16; 8,10,12	
		Inhibition	Ch6, 207-210	18,19,20,21; 2; 9,11	
M-Oct 19	16	- Enzymes V; Active site; Energetics	Ch6, 192-193, 195-196, 205-206	22	
		- Enzymes VI; Mechanism - chymotrypsin	Ch6, 213-218	24; 15	
W-Oct 21	17	- Enzymes VII; Regulation - Introduction	Ch5, 166; Ch 12 443,446-447	5,7,14	Chapter 4 Module 4A (Ch 5A) (Ch 3 & 11/LDH poster due)
F-Oct 23	18	- Enzymes VIII; Regulation – Allosteric I	Ch5, 166-167	2	

M-Oct 26	19	- <u>Enzymes IX</u> ; Regulation – Allosteric II - <u>Enzymes X</u> ; Regulation – "Hemoglobin"	Ch6, 225-232 Ch5, 168-169 Ch5, 158-159, 162-166, 169-174	6 3,7,8,10; 2,3 ; 1,2,3,4,5,8	
T Oct 27	(MOR 7:30-9pm)	- <i>Molecular Biology Review</i> ‡	Ch1, 29-32; Ch8, 279-287, Ch27, 1081		
W-Oct 28	20	- Protein Structure VIII: Stability, folding & dynamics Review Session in SCI-109	Ch4, 142-151 Ch6	14,16 1,4	Chapter 5A/Module4B (Ch4) (PostLab4 due)
F-Oct 30					
M-Nov 2		HOURLY EXAM III (8:00-10:00 AM) [Lectures 14-20; 2,3,11†] (9)			
T Nov 3	(MOR 7:30-9pm)	- <i>Molecular Biology Review</i> ‡	Ch1, 29-32; Ch8, 279-287, Ch27, 1081		
W-Nov 4	21	- <u>Nucleic Acids I</u> ; - Introduction	Ch8, 310-312, 279-285 Ch24, 957-961	1,2,22; 1,2,4,5,7,8,9 -	Chapter 5B/Module4C (Ch 4/PostLab5 due)
F-Nov 6**	22	- <u>Nucleic Acids II</u> ; - Shape	Ch8, 285-290 Ch24, 963-978	9;3 5,7,9,10,14,16; 1,1,2,4	
M-Nov 9	23	- <u>Nucleic Acids III</u> ; - Stability - <u>Nucleic Acids IV</u> ; - Using the Central Dogma Recombinant DNA in biochemistry I	Ch8, 295-299 Ch1, 29-34 Ch9, 319-325, 346 Ch24 Ch26 Ch27	6,7,8,10; 1,3 ; 10,11 - 1,2,3,4; 1,2,3,4,5 3,5,6 3; 2,3,7 1,2,3,4	
W-Nov 11		HOLIDAY – Veteran's Day			Chapter 5C/Module6A (PymolFigs due)
F-Nov 13	24	- <u>Nucleic Acids V</u> ; - Recombinant DNA in biochemistry II	Ch9, 328-332	1,2; 7,8	
M-Nov 16	25	- <u>Nucleic Acids VI</u> ; - Replication I, - <u>Nucleic Acids VII</u> ; - Transcription - <u>Nucleic Acids VIII</u> ; - Genetic Code	Ch25, 990-995, 1005-1012 Ch26, 1035-1038 Ch27, 1077-1085, 1092-1096	1-3,5-7,9,10,13-16; 1,4,3,4,6 1,2,5,6,12; 1,1,3,5 6,7,9; 1,3,5	
W-Nov 18	26	- <u>Nucleic Acids IX</u> ; - Translation	Ch27, 1088-1091, 1096-1108	5,8,10,11,13,16,17; 2,3,4,6	Chapter 6A,B/Module5 (Ch5 due) (Final LDH paper due)
F-Nov 20	27	- <u>Lipids & Membranes I</u> ; - Introduction Fatty acids & phospholipids	Ch10, 361-368,370,372,376 Ch11	1,3,4,8,10,14,16; 1,3,4 ; 1-5,6-8 8	
Sun-Nov 22		Review Session via ZOOM (time 12:30 PM) [use Office Hour Zoom-ID]			
M-Nov 23		HOURLY EXAM IV (8:00-10:00 AM) [Lectures 21-26; 4†] (8)			(PostLab6 due)
W-Sun-Nov 25-29		HOLIDAY – FALL BREAK – Happy Thanksgiving			NO LAB (Fall Break)
M-Nov 30	28	- <u>Lipids & Membranes II</u> ; - Bilayers, Membranes & Membrane proteins	Ch10 Ch11, 387-393, 395-401	12 3,4,5,6,7,9,10,13,14; 1-3 ; 1-5,9-13,19	NO LAB
W-Dec 2	29	- <u>Carbohydrates I</u> ; - Introduction - <u>Carbohydrates II</u> ; - Mono/Oligosaccharides	Ch7, 241-246 Ch7, 247-257, 272-273	1,2,4,9,10; 1,3,7,8,9,11,12 5,6,7,8,14,15,17; 3,4,6,8 ; 2,4	Chapter 6C/Module6B (remote)
F-Dec 4	30	- <u>Carbohydrates III</u> ; - Polysaccharides	Ch7, 258-267 Ch10, 371-373	26,27,28; 2,5 ; 6 -	(Ch 6 due 10 pm)
M-Dec 7	31	- <u>Vitamins & Coenzymes</u>	Ch4,6,8,10,14,16-18; 128-129,189, – 311,377-380,555-557,561,621-622, – 639,662-663,679,691-694 –	– – –	
W-Dec 9	32	- <u>Metabolism</u> ; Introduction & Bioenergetics	Ch13, 497-501, 507-514	5,6,9,10,22,24; 4; 1-4,10-12	LAB EXAM/TeamPresent.
M-Dec 14		Review Session in SCI 109 (2:00 PM) [use CLASS Zoom-ID]			
R-Dec 17 (in LAW)		FINAL EXAM (8:00–11:00 AM) [Lectures 27-32; 5,6†; & Cumulative] (8)			

§NOTE: BI Discussion sections (C1-3 & C6) will run about 75 min, usually less than the blocked time. *Problems in Textbook; Others in Study Guide (**BOLD** for "Applying what you know," and *Italicized* for "Do you know the facts.") **Last day to drop without a 'W' (10/7) and the last day to withdraw with a 'W' (11/6). †Indicates the chapters from the lab book that are covered on exam. ‡Overview of the nucleic acid structure and central dogma, with QUIZ – attendance is optional, but QUIZ counts for 10% of your Exam 4 grade (given at the end of the lecture). †labs covered on exams.

Prerequisites: Students are **REQUIRED** to have passed (≥C) 2 semesters of organic chemistry (CH 204 or CH 212).

Textbooks (all are available at the BU Bookstore):

- 1) "Lehninger's Principles of Biochemistry 7th edition" by Nelson and Cox.
- 2) "The Absolute, Ultimate Guide to Lehninger Principles of Biochemistry 7th edition" by Osgood and Occorr. Importantly, this is a study guide and solutions manual which contains detailed worked solutions to the end of chapter problems in the text.
- 3) "Biochemistry Laboratory Manual, 5th Edition" by Dean R. Tolan & Jose L. Medrano
- 4) OPTIONAL; Sapling Website

Grading:

421; Lab 30%, Best 3 of 4 hour exams 45%, Final 25%

621; Lab 25%, Best 3 of 4 hour exams 40%, Paper/Discussion 15%; Final 20%

Attendance and meeting deadlines of all dates listed above are required. There will be no make-up exams except as allowed by the policy outlined in the **Introduction**.

For Lab; lab write-ups turned in late will have points deducted (see policy in **Introduction**, on Lab Syllabus, and on the lab web site on Blackboard).

Biochemistry-A1 Home Page: <http://www.bu.edu/aldolase/biochemistry>

Academic Conduct: The Boston University rules and regulations described in the College of Arts and Sciences Academic Conduct Code will be strictly enforced. In particular, this applies to the writing of lab reports. Sharing of data and discussion is encouraged, but all written material, including graphs and tables, must be from your own hand. [Web site: <http://www.bu.edu/academics/policies/academic-conduct-code/>]