

BIOCHEMISTRY 401

Spring 2024

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M, Tu, Th, F; 9:10-10:00 am
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Recitation: Wed; 9:10-10:00 am
BPS 1420

Online Tutor: Elia Hefner (hefnerel@msu.edu)

Text: Biochemistry, Garrett & Grisham, 5th or 6th eds.

Exams (in person): February 8, March 7, April 4, April 23 (Final, 12:45 pm-2:45 pm)

Schedule:

Date		Chapter/Topic	G&G 5 th ed. pages	6 th ed. pages	
PROTEIN STRUCTURE AND ENZYMES					
1/8/24	Mo	MF	1. Introduction	7-17	4-17
1/9	Tu	MF	2. Water, pH, and ion equilibria	30-50	31-49
1/10	We	TA	Recitation		
1/11	Th	MF	3. Thermodynamics	51-74	53-76
1/12	Fr	MF	3. Thermodynamics		
1/15			Martin Luther King Jr. Day	NO CLASS	
1/16	Tu	MF	4. Amino acids	77-98	79-101
1/17	We	TA	Recitation		
1/18	Th	MF	4. Amino acids		
1/19	Fr	MF	5. Protein primary structure	101-105, 122-135	105-109; 126-143
1/22	Mo	MF	6. Protein 3D structure	141-188	147-197
1/23	Tu	MF	6. Protein 3D structure		
1/24	We	TA	Recitation		
1/25	Th	MF	13/14. Enzyme introduction	407-411, 435-436, 447-455	437-441; 465-466; 477-485
1/26	Fr	MF	13. Enzyme kinetics	134-135, 411-423	138-139; 441-453
1/29	Mo	MF	13. Enzyme kinetics		
1/30	Tu	MF	13/14. Enzyme inhibition	472, 423-429	504; 453-460
1/31	We	TA	Recitation		
2/1	Th	MF	15. Enzyme regulation	481-503	513-536
CARBOHYDRATES AND LIPIDS					
2/2	Fr	MF	7. Carbohydrates	193-232	203-242
2/5	Mo	MF	8. Lipids	233-255	245-269
2/6	Tu	MF	9. Membranes	260-308	273-319
2/7	We	TA	Recitation		
2/8	Th	MF	EXAM 1 (covers: <u>Jan. 8 - Feb. 1</u> lectures, or as per instructor)		
DNA STRUCTURE AND DNA TOPOLOGY					
2/9	Fr	JMK	10. Composition of DNA and RNA	309-328 (but not insets on 312/325)	325-345 but not insets on

2/12	Mo	JMK	11. DNA and chromosomes	341-363;961-962 (but not 352-3 on DNA quadruplexes)	360-383; 999-1000 (but not 373-4 on DNA quadruplexes)
2/13			NO CLASS		
2/14	We	TA	Recitation		
2/15	Th	JMK	11. tRNA and rRNA	365-374	386-394
DNA REPLICATION, RECOMBINATION, AND REPAIR					
2/16	Fr	JMK	28. DNA replication and DNA polymerases	947-962	985-1000
2/19	Mo	JMK	28. Replication fork and RNA replication	950-962; 963-964	988-1000; 1001-1002
2/20	Tu	JMK	28. DNA recombination; RecA, RecBCD, transposons	964-973 (but not 971-2 on knockout mice, fork restart, euk recomb)	1001-1012 (but not 1009-1010 on knockout mice, fork restart, euk recomb)
2/21	We	TA	Recitation		
2/22	Th	JMK	28. DNA repair	973-978 (but not transgenic mice)	1012-1017 (but not transgenic mice)
2/23	Fr	JMK	28. DNA repair	973-978	1012-1017
2/26 - 3/1			SPRING BREAK		
3/4	Mo	JMK	28. Mutations; mutagenesis	978-981	1017-1020
3/5	Tu	JMK	29. Bacterial transcription: initiation, elongation, and termination	993-1000	1035-1042
3/6	We	TA	Recitation		
EXAM 2 (covers: Feb. 2 – Mar. 4 lectures, or as per instructor)					
TRANSCRIPTION					
3/8	Fr	JMK	29. Transcriptional regulation: <i>lac</i> , <i>ara</i> , and <i>trp</i> operons	1000-1011	1042-1053
3/11	Mo	JMK	29. Eukaryotic promoters, enhancers, and response elements	1011-1024	1053-1066
3/12	Tu	JMK	29. RNA processing in eukaryotes; RNA structural motifs	1024-1035	1066-1078
3/13	We	TA	Recitation		
3/14	Th	JMK	30. Genetic code; tRNA and tRNA synthetases	1047-1057	1091-1101
TRANSLATION					
3/15	Fr	JMK	30. Protein synthesis, ribosome structure	1057-1061	1101-1105
3/18	Mo	JMK	30. Mechanism of protein synthesis	1061-1080	1105-1124
3/19	Tu	JMK	30. Mechanism of protein synthesis	1061-1080	1105-1124
3/20	We	TA	Recitation		
METABOLISM					
3/21	Th	TRZ	17. Overview of metabolism	551-562	583-597, 601-605
3/22	Fr	TRZ	17. Nutrition/vitamins	567-595	583-597, 601-605
3/25	Mo	TRZ	18. Glycolysis	595-603	611-636
3/26	Tu	TRZ	19. TCA cycle	609-638	643-670
3/27	We	TA	Recitation		
3/28	Th	TRZ	20. Electron transport/oxidative metabolism	70-74; 643-660	679-710
3/29	Fr	TRZ	20. Electron transport/oxidative metabolism	660-674	679-710

4/1	<i>Mo</i>	TRZ	22. Gluconeogenesis	719-731	755-766
4/2	<i>Tu</i>	TRZ	22. Glycogen metabolism	731-744	767-779
4/3	<i>We</i>	TA	Recitation		
4/4	<i>Th</i>	TRZ/JMK	EXAM 3 (covers: <u>Mar. 5 – Mar. 28</u> lectures, or as per instructor)		
4/5	<i>Fr</i>	TRZ	22. Pentose phosphate shunt	744-755	780-787
4/8	<i>Mo</i>	TRZ	22. Pentose phosphate shunt	744-755	780-787
4/9	<i>Tu</i>	TRZ	23. Fatty acid catabolism	761-786	795-816, 818-819
4/10	<i>We</i>	TA	Recitation		
4/11	<i>Th</i>	TRZ	24. Lipid metabolism	791-808	825-841
4/12	<i>Fr</i>	TRZ	24. Lipid metabolism	808-820	841-851
4/15	<i>Mo</i>	TRZ	24. Cholesterol metabolism	820-832	851-865
4/16	<i>Tu</i>	TRZ	24. Bile, steroids, and nuclear receptors	833-837	869-872
4/17	<i>We</i>	TA	Recitation		
4/18	<i>Th</i>	TRZ	25. Nitrogen assimilation & metabolism	841-886	877-887
4/19	<i>Fr</i>	TRZ	25. Amino acid metabolism	841-886	889-921
4/23	<i>Tu</i>	TRZ	FINAL EXAM (covers: Mar. 29 – Apr. 19 lectures, or as per instructor) 12:45 pm		