

BIOCHEMISTRY 401

Spring 2026

Instructors: Prof. M. Feig (**MF**; feig@msu.edu) *coordinator*
Prof. T. Zacharewski (**TRZ**; tzachare@msu.edu)
Prof. W. Yang (**WY**; yangwi@msu.edu)
Prof. J. Kaguni (**JMK**; kaguni@msu.edu)
Office Hours: by arrangement via email

M, Tu, Th, F; 9:10-10:00 am
STEM 2201

Teaching Assistant: Sepideh Kianian (**TA**; kianians@msu.edu)
Office Hour: TBD

Recitation: Wed; 9:10-10:00 am
CEM 183

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

Exams (in person): February 12
March 12
April 9
April 28 (**12:45 pm**)

Schedule:

Date		Chapter/Topic	G&G 5 th ed. pages	6 th ed. pages
PROTEIN STRUCTURE AND ENZYMES				
1/12/26	Mo MF	1. Introduction	7-17	4-17
1/13	Tu MF	2. Water, pH, and ion equilibria	30-50	31-49
1/14	We TA	Recitation		
1/15	Th MF	3. Thermodynamics	51-74	53-76
1/16	Fr MF	3. Thermodynamics		
1/19		Martin Luther King Jr. Day	NO CLASS	
1/20	Tu MF	4. Amino acids	77-98	79-101
1/21	We TA	Recitation		
1/22	Th MF	4. Amino acids		
1/23	Fr MF	5. Protein primary structure	101-105, 122-135	105-109; 126-143
1/26	Mo MF	6. Protein 3D structure	141-188	147-197
1/27	Tu MF	6. Protein 3D structure		
1/28	We TA	Recitation		
1/29	Th MF	13/14. Enzyme introduction	407-411, 435-436, 447-455	437-441; 465-466; 477-485
1/30	Fr MF	13. Enzyme kinetics	134-135, 411-423	138-139; 441-453
2/2	Mo MF	13. Enzyme kinetics		
2/3	Tu MF	13/14. Enzyme inhibition	472, 423-429	504; 453-460
2/4	We TA	Recitation		
2/5	Th MF	15. Enzyme regulation	481-503	513-536
CARBOHYDRATES AND LIPIDS				
2/6	Fr MF	7. Carbohydrates	193-232	203-242
2/9	Mo MF	8. Lipids	233-255	245-269
2/10	Tu MF	9. Membranes	260-308	273-319
2/11	We TA	Review		
2/12	Th MF	EXAM 1 (covers: <u>Jan. 12 - Feb. 5</u> lectures, or as per instructor)		
2/13	Fr	NO CLASS		

DNA STRUCTURE AND DNA TOPOLOGY					
2/16	Mo	JMK	10. Nucleotides of DNA and RNA	309-328 (but not insets on 312/325)	325-345 but not insets on 328,331,342
2/17	Tu	JMK	11. Nucleic acids	341-363;961-962 (but not 352-3 on DNA quadruplexes)	360-383; 999-1000 (but not 373-4 on DNA quadruplexes)
2/18	We	TA	Recitation		
2/19	Th	JMK	11. 2D and 3D structures of nucleic acids	365-374	386-394
DNA REPLICATION, RECOMBINATION, AND REPAIR					
2/20	Fr	JMK	28. DNA supercoiling, DNA replication	947-962	985-1000
2/23	Mo	JMK	28. DNA replication, DNA polymerases fork and RNA replication	950-962; 963-964	988-1000; 1001-1002
2/24	Tu	JMK	28. DNA replication, DNA polymerases fork and RNA replication	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)
2/25	We	TA	Recitation		
2/26	Th	JMK	28. DNA recombination; RecA, RecBCD, transposons	973-978 (but not transgenic mice)	1012-1017 (but not transgenic mice)
2/27	Fr	JMK	28. DNA recombination; RecA, RecBCD, transposons	973-978	1012-1017
2/28 - 3/8 SPRING BREAK					
3/9	Mo	JMK	28. Mutations, mutagenesis	978-981	1017-1020
3/10	Tu	WY	29. DNA repair	993-1000	1035-1042
3/11	We	TA	Review		
3/12	Th	MF/JMK	EXAM 2 (covers: Feb. 6 – Feb. 27 lectures, or as per instructor)		
TRANSCRIPTION					
3/13	Fr	WY	29. Bacterial transcription: initiation, elongation, and termination	1000-1011	1042-1053
3/16	Mo	WY	29. Transcriptional regulation: lac operon	1011-1024	1053-1066
3/17	Tu	WY	Eukaryotic promoters, enhancers, and response elements		
			29. Eukaryotic promoters, enhancers, and response elements; RNA processing in eukaryotes	1024-1035	1066-1078
3/18	We	TA	Recitation		
3/19	Th	WY	30. Genetic code; tRNA and tRNA synthetases	1047-1057	1091-1101
TRANSLATION					
3/20	Fr	WY	30. Protein synthesis, ribosome structure	1057-1061	1101-1105
3/23	Mo	WY	30. Mechanism of protein synthesis	1061-1080	1105-1124
3/24	Tu	WY	30. Mechanism of protein synthesis	1061-1080	1105-1124
3/25	We	TA	Recitation		
METABOLISM					
3/26	Th	TRZ	17. Overview of metabolism	551-562	583-597, 601-605
3/27	Fr	TRZ	17. Nutrition/vitamins	567-595	583-597, 601-605
3/30	Mo	TRZ	18. Glycolysis	595-603	611-636
3/31	Tu	TRZ	19. TCA cycle	609-638	643-670
4/1	We	TA	Recitation		

4/2	Th	TRZ	20. Electron transport/oxidative metabolism	70-74; 643-660	679-710
4/3	Fr	TRZ	20. Electron transport/oxidative metabolism	660-674	679-710
4/6	Mo	TRZ	22. Gluconeogenesis	719-731	755-766
4/7	Tu	TRZ	22. Glycogen metabolism	731-744	767-779
4/8	We	TA	Review		
4/9	Th	TRZ/ WY	EXAM 3 (covers: <u>Mar. 9 – Apr. 3</u> lectures, or as per instructor)		
4/10	Fr	TRZ	22. Pentose phosphate shunt	744-755	780-787
4/13	Mo	TRZ	22. Pentose phosphate shunt	744-755	780-787
4/14	Tu	TRZ	23. Fatty acid catabolism	761-786	795-816, 818-819
4/15	We	TA	Recitation		
4/16	Th	TRZ	24. Lipid metabolism	791-808	825-841
4/17	Fr	TRZ	24. Lipid metabolism	808-820	841-851
4/20	Mo	TRZ	24. Cholesterol metabolism	820-832	851-865
4/21	Tu	TRZ	24. Bile, steroids, and nuclear receptors	833-837	869-872
4/22	We	TA	Recitation		
4/23	Th	TRZ	25. Nitrogen assimilation & metabolism	841-886	877-887
4/24	Fr	TRZ	25. Amino acid metabolism	841-886	889-921
4/28	Tu	TRZ	FINAL EXAM (covers: Apr. 6 – Apr. 24 lectures, or as per instructor) 12:45 – 2:45 pm		