

**BIOCHEMISTRY 401****Spring 2017**

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M, Tu, Th, F; 9:10-10:00 a.m.  
 E100 Vet. Med. Center

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 Tuesdays 1-2:30 pm, Room 208 Biochemistry Building

Instructor office hours: (MF) *Room 218 Biochemistry, Mon/Tue/Thu/Fri 10:30 – 12:00 or by arrangement* (TRZ, JMK) By arrangement.

Date	Chapter/Topic	Assigned Reading Pages, G&G	
		5 <sup>th</sup> ed.	4 <sup>th</sup> ed.
1/9/17	MF 1. Introduction	7-17	5-17
1/10	MF 2. Water, pH, and ion equilibria	30-50	28-47
1/12	MF 3. Thermodynamics	51-59	48-56
1/13	MF 3. Thermodynamics	59-74	56-67,593-596
<b>1/16</b>	<b>Martin Luther King Jr. Day</b>	<b>No Class</b>	
1/17	MF 4. Amino acids	77-98	70-91
1/19	MF 4. Amino acids	77-98	70-91
1/20	MF 5. Proteins: primary structure and function	101-105,122-135	93-97,109-117,119-122
1/23	MF 6. Proteins: three-dimensional structure	141-188	134-179
1/24	MF 6. Proteins: three-dimensional structure	141-188	134-179
1/26	MF 13/14. Enzymes: Introduction; Transition State Stabilization	407-411,435-436, 447-455	382-385,409-410,419-426
1/27	MF 13. Enzymes: Kinetics part 1	134-135,411-423	122-123,386-397
1/30	MF 13. Enzymes: Kinetics part 2	411-423	386-397
1/31	MF 13/14. Enzymes: Inhibition and Pharmaceuticals	472, 423-429	443, 397-403
2/2	MF 15. Enzyme regulation	481-503	452-472
2/3	MF 7. Carbohydrates	193-232	181-218
2/6	MF 7. Carbohydrates	193-232	181-218
<b>2/7</b>	<b>Exam 1 (includes Feb. 2 lecture, or as per instructor)</b>		
2/9	MF 8. Lipids	233-255	219-237
2/10	MF 8. Lipids	233-255	219-237
2/13	MF 9. Membranes	260-308	242-290

**DNA STRUCTURE AND DNA TOPOLOGY**

2/14	JMK	10. The composition of DNA and RNA	309-328 but not insets on 312, 325	291-309 but not insets on 294, 306
2/16	JMK	11. DNA and chromosomes	341-363, 961-962 but not 352-3 on DNA quadruplex	320-340 but not 329-30 on DNA quadruplex
2/17	JMK	11. tRNA; rRNA	365-374	341-351

**THE THREE R'S: DNA REPLICATION, RECOMBINATION, AND REPAIR**

2/20	JMK	28. Rules of DNA replication	947-950	862-865
		28. DNA polymerases	950-962	865-875
2/21	JMK	28. The replication fork	950-962	865-875
		28. RNA replication	963-964	876-877
2/23	JMK	28. DNA recombination	964-973 but not the part on 972 on fork restart	877-886 but not the part on 885 on fork restart
		RecA, RecBCD, transposons		
2/24	JMK	28. DNA repair	973-978	887-891
2/27	JMK	28. More DNA repair	973-978	887-891

**TRANSCRIPTION**

2/28	JMK	28. Mutations; mutagenesis	978-981	891-894
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**3/2 EXAM 2 (includes Feb. 28 lecture, or as per instructor)**

3/3	JMK	29. Bacterial transcription: initiation, elongation, and termination	993-1000	906-912
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**SPRING BREAK (3/6-3/10)**

3/13	JMK	29. Transcriptional regulation: <i>lac</i> , <i>ara</i> , and <i>trp</i> operons	1000-1011	912-923
3/14	JMK	29. Eukaryotic promoters, enhancers, and response elements	1011-1024	924-935
3/16	JMK	29. RNA processing in eukaryotes	1027-1036, 1024-1027	939-945, 935-939
		29. Structural motifs		

**TRANSLATION**

3/17	JMK	30. The genetic code; tRNAs and tRNA synthetases	1047-1057	952-961
3/20	JMK	30. Protein synthesis, ribosome structure	1057-1061	961-965
3/21	JMK	30. Mechanism of protein synthesis	1061-1080	965-984
3/23	JMK	31. Protein folding and translocation, degradation	1087-1099	987-998
3/24	JMK	31. Protein degradation	1099-1107	998-1005

3/27	TRZ	17. Overview of metabolism	551-562	511-521
3/28	TRZ	17. Metabolic Energy	562-573	521-532
3/30	TRZ	17. Nutrition/vitamins	577-595	535-551
3/31	TRZ	18. Glycolysis	595-603	552-559
4/3	TRZ	19. TCA cycle	609-625	563-578
4/4	TRZ	19. TCA cycle	628-638	581-589
4/6	TRZ	20. Electron transport/oxidative metabolism	70-74,643-660	592-611
4/7	TRZ	20. Electron transport/oxidative metabolism	660-674	611-624
4/10	TRZ	22. Gluconeogenesis	719-731	662-673
<b>4/11</b>		<b>EXAM 3 (includes April 6 lecture, or as per instructor)</b>		
4/13	TRZ	22. Gluconeogenesis and glycogen	719-731	662-673
4/14	TRZ	22. Glycogen metabolism	731-744	673-683
4/17	TRZ	22. Pentose phosphate shunt	744-755	683-693
4/18	TRZ	23. Fatty acid catabolism	761-786	697-718
4/20	TRZ	24. Lipid metabolism	791-808	722-737
4/21	TRZ	24. Lipid metabolism	808-820	737-750
4/24	TRZ	24. Cholesterol & hormones	820-832	751-761
4/25	TRZ	24. Bile, steroids and nuclear receptors	833-837	761-765
4/27	TRZ	25. Nitrogen assimilation & metabolism	841-886	768-810
4/28	TRZ	25. Amino acid metabolism	841-886	768-810

**FINAL EXAM: Tuesday May 2, 7:45 am to 9:45 am, E100 VMC**  
**Noncumulative (covers from end of Exam 3 material to end of course)**