

# General Biochemistry 115:403/503

## Lecture and Exam Schedule, Fall, 2020

Instructor: Peter C. Kahn (PCK)

Class Meeting	Date	Subject	Chapter
1	T 9/1	Course policies; Introduction to Biochemistry.	1
2	F 9/4	Introduction to thermodynamics; hydrophobic effect. Buffers.	1,2
	T 9/8	<b>No class. Monday classes this day</b>	
3	F 9/11	Titration of ampholytes; pI; electrophoresis & ion exchange; amino acids	2, 3
4	T 9/15		
5	F 9/18	Proteins & peptides: covalent structure, sequence analysis, synthesis. Intro. to molecular evolution.	3
6	T 9/22	3D Structure description: secondary, tertiary, quaternary structure; families of tertiary folds. Protein folding: thermodynamics, kinetics; chaperonins; molecular diseases, a.a. substitution, designer proteins.	4
7	F 9/25		
8	T 9/29	First order reaction kinetics & half-lives. Enzyme assays & Michaelis-Menten kinetics. Competitive, noncompetitive & uncompetitive inhibition. Use of theory & mathematical modeling.	6
9	F 10/2	<b>FIRST EXAMINATION</b>	
10	T 10/6	Mechanism of enzyme action.	6
11	F 10/9	Allostery & regulation of enzyme activity; ligand binding.	5, 6
12	T 10/13	Nucleotides, nucleic acid and chromosome structure, sequence determination, oligonucleotide synthesis	8,9
13	F 10/16		
14	T 10/20		
15	F 10/23	Introduction to bioinformatics, genomics & proteomics	9
16	T 10/27	Carbohydrates: structure, analysis, properties.	7
17	F 10/30	<b>SECOND EXAMINATION</b>	
18	T 11/3	Carbohydrates: structure, analysis, properties, continued	7
19	F 11/6	Lipids & membranes: structure, analysis, properties.	10, 11
20	T 11/10		
21	F 11/13		
22	T 11/17	Signaling	12
23	F 11/20	Introduction to metabolism. Bioenergetics.	13
24	T 11/24		
	F 11/27	<b>No class; Thanksgiving recess</b>	
25	T 12/1	<b>THIRD EXAMINATION</b>	
26	F 12/4	Carbohydrate metabolism I: glycolysis, pentose phosphate shunt, gluconeogenesis, glycogen metabolism; Controls.	13, 14, 15
27	T 12/8		

Text: Nelson & Cox, *Lehninger: Principles of Biochemistry*, Seventh Edition, W. H. Freeman & Co., 2017.  
(Note the availability of three versions which differ in price.)

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## General Information and Course Policies

**Learning Goals:** Students will gain a fundamental understanding of what makes living systems tick at the molecular level. They will also gain an understanding of the experimental methods which give rise to biochemical knowledge. The course will impart a thorough grasp of the relationship between biochemical structure and function as well as of the evolutionary interrelationships of all forms of life. The primary emphases this term are to master structure of biological polymers, including how that structure is determined, to understand and be able to utilize enzyme kinetics, and to gain a firm grasp of the role of thermodynamics in biochemistry.

Welcome to the first semester of General Biochemistry, a one-year integrated survey of biochemistry. I hope you come to enjoy the subject as I do, and I will do everything I can to make your experience of it agreeable. To that end, should you have a problem or wish to explore a topic in greater depth than possible in class, please feel free to contact me. One-on-one office hours via Zoom will be available within a week or so once the technical issues are worked out. It will be necessary to sign up for these. In addition, I will be pleased to make appointments with those who cannot meet at the scheduled times.

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There are several course policies of which you should be aware. The lecture schedule on the reverse side of this page gives an indication of the topics to be covered, but it is not a complete list. The chapter numbers are intended as a guide to where to *begin* your reading in the text, but material in each lecture topic may be found in other chapters, as well. **Use the index at the back of the book and the table of contents!** Some lecture material is not in the text at all, and supplementary readings will be suggested as appropriate.

The policy with respect to material for which you may be held responsible is that **(a) if it is covered in lecture, you are responsible for it, and (b) if a section of the text or if another source is specifically assigned to be mastered, you are responsible for it even if it is not covered in lecture.** There will not be many of these. The text is thus a supplement to the lectures – not the other way around; read as much of it as you find necessary. Use whatever other sources you may find in the library, including other texts, as well.

Grading: there will be three hour examinations during the term plus a cumulative final. There will also be a set of self-paced self-teaching tutorials in structural biology, which you must do, and there will be problem sets. Each hour examination represents 15% of the grade. The set of tutorials and the problem sets constitute a single assignment with the tutorials counting for 20% of the grade, while the problems will be 5%. The final counts for 30%. Copies of last year's exams will be published on the course's Canvas web site. The structural biology tutorials are described in a separate memorandum. Because this is the first time Canvas has been used for the course, it may be necessary to change these percentages to accommodate Canvas assignments.

The Learning Resource Center offers supplementary instruction. The Learning Assistant (LA) has taken General Biochemistry and done well in it. She will offer regular review sessions. Her hours will be posted within the next week or two. **You are urged to take advantage of this help as well as that of the faculty.** Course related material will be found at [canvas.rutgers.edu](https://canvas.rutgers.edu).

You will be required to sign and submit a pledge of academic integrity. Failure to submit the pledge will cause your grade not to be submitted to the registrar. Failure to abide by the pledge will lead to proceedings at the Office of Judicial Affairs.

If you are unsure whether your training has prepared you adequately for General Biochemistry, please contact me forthwith.

Peter Kahn