Spring 2021/Chem 37800
Hunter College, Dept. of Chemistry
Biochemistry Laboratory

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Recitation: **Online:** it will be posted on Blackboard every Monday at 8:30 AM. Asynchronous activity.
Lab: **Hybrid:** first 5 weeks online, the rest in person. Tuesdays-Fridays, Room 1413 HN; 5 hr/week.

Lab Manual: Ninfa, Ballou, Benore (ISBN 13 978-0470087664; ISBN-10: 0470087668). Fundamental Approaches to Biochemistry and Biotechnology, **1st or 2nd edition 1998 or 2010**. Fitzgerald Science Press, Bethesda, MD.
Background reading (optional): Garrett and Grisham (ISBN 0-534-49033-6), BIOCHEMISTRY, 5th edition, 2013. Brooks/Cole.R.H.

-YOU WILL NOT BE ABLE TO TAKE THE CLASS WITHOUT THE FOLLOWING PREREQ: CHEM 22500 with grade of C or better. Pre-Req or Co-Req: CHEM 37700 or CHEM 64100.

-Attendance to recitation and laboratory is Mandatory!
-No changes in recitation hours will be allowed.

-Stay alert to Blackboard announcements. That will be the primary source of communication.
-Attendance to laboratory is Mandatory!
-No changes in laboratory hours will be allowed.
-You need to provide your contact information to your TA (cell phone # in your first lab for tracing).
-You will work individually keeping 6 feet distance from your classmates.
-You will not be able to walk around during the class to keep social distancing.
-You HAVE to wear a mask and goggles all the time in the lab. We will not provide those PPE material, so you will have to be prepared.
-Plan to arrive to the class a little earlier as you will need to complete the Health Screening form before you enter to the Hunter. You will need to use the 68th street entrance of the West building.

Learning Outcomes: By the end of this course, students will be able to:
1. Explain basic biochemical and molecular biological concepts and principles
2. Appreciate the different levels of biological organization, from molecules to organisms
3. Implement concepts of chemistry, physics, mathematics, informatics and scientific information communication into Molecular Biology.

4. Explain the importance of the scientific method to understanding natural phenomena.
5. Effectively communicate scientific data and ideas to a liberal arts audience both orally and in writing.
6. Critically evaluate experimental data and primary papers, develop a hypothesis, and design experiments to address an interesting and novel problem.

Quizzes: **Three short quizzes (approx. 20 min duration) will be given on Blackboard and have to be return as a word document to Dr. Kleiman at fkleiman@hunter.cuny.edu**
Quizzes cover the following:
a) background material covered or assigned by the Recitation instructor, and b) the corresponding laboratory experiments performed prior to the quiz. The dates of the quizzes and the chapters covered are indicated in the WEEKLY SCHEDULE OF EXPERIMENTS. Makeup is possible only under extraordinary circumstances, with permission of Professor Kleiman. Schedule of Quizzes: During recitation class, approx. 20 min.

Format of quiz: Very similar to the problems and examples on the pages suggested being prepared in advance from the lab manual. The web page link gives solutions to the problems given in the lab manual. Work through all problems and examples before the quiz! Material is not new to you; it was covered in General Chemistry and Biochemistry 1.

Recitation Lecture: 1 hr/week, presented by Prof Kleiman. The primary purpose of recitation is to explain the background material for the experiments, based on the appropriate chapters in Ninfa and Ballou. In addition, important instructions and modifications for the oncoming experiment, which are not in the book, are frequently included in the recitation lecture. **Attendance is MANDATORY and is taken at each recitation class. Each unexcused absence results in loss of 5 points per session from the overall lab grade.** Please take notes of Recitation in a dedicated notebook.

Laboratory Safety: You are required to read thoroughly Chapter 2, Sec 1 before the first laboratory session. You will be asked to sign a statement saying you have read this information. You should bring your own goggles.

Advance preparation for the lab: Before you come to the lab you are expected to know which experiment you are going to perform that day, and to have a written flow-chart of what to do, step by step. Students should keep these notes in a dedicated notebook. The TA will check this material at the beginning of each session. The background material should have been studied also. The lack of preparation will result in loss of 5 points per session from the overall lab grade. The WEEKLY SCHEDULE indicates the pages in Ninfa and Ballou assigned for advance preparation for each chapter.

Attendance to the lab is mandatory. Students may miss a lab once for a legitimate reason (proof required). A make up must be scheduled at the **same week** of the missed laboratory. The TA's of the missed and of the make up labs and Professor Kleiman should be notified in advance. **Punctuality is mandatory**, students should enter the lab on time. The students are not supposed to leave the lab before the 4 hours are over.

Grading: The grade in this course will be determined by the following:
1. A written lab report on the chapters indicated in the WEEKLY SCHEDULE OF EXPERIMENTS. Lab reports are due in the week indicated in the WEEKLY SCHEDULE OF EXPERIMENTS. **The report must be original; each student should present its own interpretation of the results. Any plagiarism will be dealt according to Hunter College policy. The lab report must be typed and submitted through Blackboard, as each lab report will be checked for plagiarism with SafeAssign.**
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2. The scores of the three quizzes.

3. On-site observation of the student's performance in the laboratory. Evidence for lack of preparation and of advance planning of the experiment is a negative factor.
4. Publication of a scientific communication in Wikipedia.

The total score of the three quizzes constitutes 45% of the overall grade while the lab reports constitute 45%. Results of "on-site observation" may detract up to 5% of your total score. Publication of a scientific communication in Wikipedia constitutes 10%. The exams will be graded in the percentage scale and reported in the letter grade following Hunter College grading system.

Laboratory Notebook: It is required that you use a bound (as opposed to loose leaf binder) laboratory notebook and use it exactly as described in the lab manual, Chapter 1 Sec 5. The notebook should contain notes of your plan written before you come to the lab. The notebook should be available for the lab instructor upon request during the lab session.

Cleanup: Students should leave their bench in order for the next lab session. Students should wash glassware they used.

Biochemistry Laboratory (Spring 2021)
Chem 378
Weekly Schedule of Experiments

Week	Recitation	Lab Date	Chapter; experiment	Quizzes	Lab report due
1	2/1	2/2-2/5	Ch.3: Spectrophotometry; 3-1, 3-2, 3-3, 3-4		
2	2/8	2/9-11 (2/12 no class) 2/19 (2/15-18 no class)	Ch.4: Quantification of protein concentration; 4-1 (Bradford). Ch.5: Chromatography; 5-1.		
3-4	2/22	2/23-26	Ch.5: Chromatography; 5-2 Ch.6: Gel electrophoresis of proteins; 6-1		
5-6	3/1	3/2-5	Ch. 14: Polymerase Chain Reaction (PCR). Recombinant DNA techniques: restriction enzymes.		
7	**3/8**	3/9-12	Recombinant DNA techniques: ligation/restriction enzymes.	**3/8 Quiz 1** (Ch. 3-6)	
8	3/15	3/16-19	Recombinant DNA techniques: ligation. Ch. 13: Transformation and agarose gel electrophoresis.		Report 1 (Ch. 3-6) at week 8.
9	**3/22**			**3/22 Quiz 2** (Ch. 13-14, PCR)	
10-14	4/5 4/12 4/19 4/26	4/6-9 4/13-16 4/19-23 4/27-30	Ch. 9: Isolation and characterization of the enzyme alkaline phosphatase from *E. coli*; 9-1.		Report 2 (Ch. 13-14, PCR) at week 10
15	5/3	5/4-7	Ch. 10: Enzyme kinetics: K_m and V_{max}; 10-1.		
16	**5/10**		Wikipedia class		
17	**5/17**	REPORT 5/17-21		**5/17 Quiz 3** (Ch. 9-10)	Report 3 (Ch. 9-10) at week 17

***5/10: Wikipedia Editing class offered by Professor Iris Finkel**
***In person classes.**