Biochemisty Gr.2
Friday 9:30-12:00 @ A-2024 (Davutpasa Campus)
Instructor: Assist.Prof.Dr. Alper Yilmaz
Email: alyilmaz@yildiz.edu.tr
Office Hours: by appointment
http://yarbis.yildiz.edu.tr/alyilmaz/course/viewCourse/id/7176

Course Goals

In this course, you will learn:

1. Various proterties of amino acids.
2. The diversity in 3D structure of protein and importance of 3D structure (conformation) for the function of any protein.
3. Biochemical function of proteins - also known as "enzymes".
4. Glycobiology where carbohydrates are used for storage, structure and signalling.
5. Biochemical approaches to nucleic acids: synthesis and sequencing of DNA

Course Materials

The lecture notes are taken from the following textbook: **LEHNINGER PRINCIPLES OF BIOCHEMISTRY** *(David L. Nelson,Michael M. Cox, 5. Edition, 2008)*. The figures in slides are taken from 6th edition, so there might be discrepancy about figure numbers.

Lecture notes are handed in copy center across our department. PDF versions of lecture slides can be downloaded from YARBIS page.

Lecture notes contain mostly pics with sparse text, thus you need to listen the instructor and take notes.

Grading

Your grade will come from the following sources:

- Midterm: 35%
- Final: 40%
- Quiz: 10%
- Assignment: 10%
- Attendance: 5%

Final exam is from the topics covered after midterm exam.

There will be 3 quizzes and highest 2 scores will be considered. If you attend all lectures or miss only one lecture then you'll get 5 points for attendance. For every 1-2 lectures missed you'll lose 1 point.

Assignment will be 2-3 page long writing about *Oxygen binding property of fetal hemoglobin*.

Communication

I'm trying to respond emails as quickly as possible. If you don't get a response within 1-2 days please don't hesitate to send a reminder email.

The changes pertaining to exam date, time and assignment due dates should be decided in class after discussing with everybody. Please don't ask for changes individually, otherwise notification of whole class becomes a hassle.

Schedule

Below is the tentative schedule for the course. Depending on the speed we go through topics there might be shifts in the schedule. For each week, first date is for Group 1 and second date is for Group 2.

***September 23*. Introduction**

General information about the lecture such as grading policy, course materials, etc. is provided. Then we start our lecture with an essential molecule: Water

Chapter 1 in our textbook.

September 30. **Amino Acids, Peptides, and Proteins**

Various proterties of amino acids
Chapter 3 in our textbook.

October 7. **Amino Acids, Peptides, and Proteins (cont'd)**

Seperation and purification of proteins
Chapter 3 in our textbook.

October 14. **Amino Acids, Peptides, and Proteins (cont'd)**

Structure of proteins. Determining primary structure of proteins. Synthesis of proteins.
Chapter 3 in our textbook

October 21. **The Three-Dimensional Structure of Proteins**

Properties of secondary structures; helix, sheet and turn. Certain dihedral angels in certain structures.
Chapter 4 in our textbook.

October 28. **The Three-Dimensional Structure of Proteins (cont'd)**

Tertiary and quaternary structures in proteins. Classification of proteins based on 3D structure. Protein folding.
Chapter 4 in our textbook.

November 4. **Protein Function**

Protein-ligand interactions. Hemoglobin as an example.
Chapter 5 in our textbook.

Enzymes

November 11. **Enzymes**

Classification of enzymes by reactions they catalyze. Catalytic power and specificity of enzymes. Enzyme kinetics and inhibition mechanisms.
Chapter 6 in our textbook.

***November 18.* Enzymes (cont'd)**

Regulatory enzymes and mechanisms to regulate those enzymes. Reversible and irreversible covalent modifications.

Chapter 6 in our textbook.

***November 25.* (MIDTERM)**

***December 2.* Carbohydrates and Glycobiology**

Chemical structure of saccharides. Mono-, di-and poly-saccharides.

Chapter 7 in our textbook.

***December 9.* Carbohydrates and Glycobiology (cont'd)**

Homopolysaccharide folding. Glycosaminoglycans, the heteropolysaccharides of the extracellular matrix (ECM). Glycoconjugates: Proteoglycans, Glycoproteins, and Glycolipids

Chapter 7 in our textbook.

***December 16.* Nucleotides and Nucleic Acids**

Chemical properties of nucleotides and nucleic acids formed by polymerization of nucleic acids. Folding and denaturation-renaturation in nucleic acids. DNA sequencing.

Chapter 8 in our textbook.

***December 23.* DNA-Based Information Technologies**

Chapter 9 in our textbook.

***December 30.* DNA-Based Information Technologies (cont'd)**

Chapter 9 in our textbook.

Acknowledgments

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