

## **Chem 473 Biochemistry I**

Fall 2017

Tues /Friday 10:00-11:25

FMH 110

Instructor: Edgardo T. Farinas, PhD

Office: Tiernan 151

Phone: 973-642-7363

Email: edgardo@njit.edu

Office Hours: Weds 10:00-12:00 or by appointment

***Class questions will not be answered by email. You must come to office hours.***

Text: Biochemistry; R. H. Garrett and C. M. Grisham; 5<sup>th</sup> edition; Brooks/Cole Cengage Learning; ISBN-13: 978-1-133-10629- Course description: Covers advanced topic in Biochemistry.

### ***Learning outcomes***

#### ***At the end of this course the student will:***

1. Explain basic elements of structure of amino acids, proteins, nucleic acids, carbohydrates and lipids
2. Describe higher order structure in proteins and relate it to function
3. Illustrate examples to demonstrate that structure determines function
4. Demonstrate the role of the intermolecular forces in macromolecular structure and function
5. Apply knowledge of chemical kinetics in understanding enzyme catalysis and mechanism
6. Interpret kinetic data and identify types of enzyme inhibition
7. Write and describe the key biosynthetic pathways in living systems
8. Apply thermodynamic principles to understand energy production in biological systems
9. Discuss Electron transport and energy production
10. Discuss biochemical processes: replication, transcription, translation
11. Explain biosynthesis of proteins

### ***Point scheme:***

3 mid terms (Mondays): **100 points each**

Final: **200 points**

In class performance/Homework: **100 points**

**Total 600 points**

The NJIT honor code will be upheld, and that any violations will be brought to the immediate attention of the Dean of Students.

Students will be consulted by the instructor and must agree to any modifications or deviations from the syllabus throughout the course of the semester.

<b>Week</b>	<b>Topic</b>	<b>Textbook Chapter correlation</b>
Week 1	Biochem overview, Water	<b>1-3</b>
Week 2	Amino acids, Protein structure, primary secondary, tertiary protein function	<b>4-6</b>
Week 3	Protein structure function relationship, structural motifs, membrane proteins	
Week 4	<b>CATALYSIS</b> Kinetics, Enzyme mechanism, plotting kinetics, inhibition, drug mechanism allosteric inhibition, Hb and Myo	<b>13-15</b>
Week 5	<b>Exam 1 Proteins , enzymes</b>	
Week 6	Carbohydrates: Structural aspects, monosaccharides, polysaccharides	<b>7</b>
Week 7	Lipids, structure, function, Vitamins and coenzymes	<b>8</b>
Week 8	<b>ENERGY TRANSDUCTION:</b> Metabolism, Catabolism, citric acid cycle oxidative phosphorylation	<b>17</b>
Week 9	<b>Exam 2: Lipids, carbohydrates, exam</b>	
Week 10	Nucleic Acids, RNA, DNA: structure, function, DNA synthesis, recombinant DNA	<b>10-13</b>
Week 11	Transcription	<b>29</b>
Week 12	Translation	<b>30</b>
<b>Exam 3, Nov 24:</b>	<b>Exam 3: Biological information processing</b>	
Week 14	Control of energy production and essential macromolecules	<b>17-20</b>
Week 15	Review	