Chemistry 372: Biochemistry II
Spring 2020

Department of Chemistry and Biochemistry
Queens College, City University of New York

Professor Susan Rotenberg
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Lecture: Wednesday 10:40 – 12:00 and Friday 10:00 – 12:20
Remsen 105

Office hours: Wednesday 9:30 – 10:20 AM and Friday 1:00 – 1:50 PM
Remsen 117B

Text: *Lehninger Principles of Biochemistry*, 7th edition, D. L. Nelson and M.M. Cox, W. H. Freeman and Co.

Course description: Metabolism of lipids, amino acids, nucleotides, nucleic acids, and proteins.

Course goals:

Biochemistry II covers the biosynthesis of the most of the major classes of cellular components: amino acids and proteins, nucleotides and nucleic acids, membrane lipids, and photosynthetic formation of carbohydrates. This survey of biosynthesis includes the chemistry of individual reactions, regulation of the catalytic activity of enzymes, organization of enzymatic reactions into metabolic pathways, and interactions within and between the metabolic pathways. The first part of the semester covers synthesis of small molecules, including amino acids, membrane lipids and nucleotides. The second part covers synthesis of macromolecules, including DNA, RNA, and proteins.

After completing the course students will be able to:

- Describe and analyze the major biosynthetic pathways of cell components, including amino acids, lipids, and nucleotides, from common metabolic intermediates.
- Explain how defects in metabolic reactions can lead to disease.
- Analyze the regulation and interactions of metabolic pathways to generate optimal levels of cell components and respond to environmental and physiological conditions.
- Describe the conversion of light energy into chemical energy by photosynthesis.
- Explain how DNA is maintained as a stable repository of genetic information through replication and repair.
- Follow the expression of genetic information from DNA through RNA into proteins and analyze the control of gene expression at the levels of transcription and translation.

Recitation:

The first part of class on Fridays is a recitation section, in which students work on the problems in groups. The recitation problems, consisting of questions from the textbook and previous exams, will be posted weekly. Students will receive extra credit for presentation of the problem solutions.

Grading:

There will be three lecture exams and a comprehensive final exam. Each will count for 25% of the final grade. No makeup exams will be given; written documentation is required if you miss an exam.

Exam 1: Wed, February 26 Chapters 20, 21
Exam 2: Wed, March 25 Chapters 22, 8, 9
Exam 3: Wed, May 13 Chapters 24, 25, 26
Final Exam: May Comprehensive

Tentative course schedule:

Topics	Chapter	Dates
Photophosphorylation	19	1/29, 1/31
Carbohydrate biosynthesis in plants	20	2/5, 2/7
Lipid biosynthesis	21	2/14, 2/19
Biosynthesis of amino acids	22	2/21, 2/28
Biosynthesis of nucleotides	22	3/4, 3/6
Nucleotides and nucleic acids	8	3/11
DNA-based information technologies	9	3/13, 3/18
Genes and chromosomes	24	3/20, 3/27
DNA metabolism	25	4/1, 4/3, 4/7
RNA metabolism	26	4/17, 4/22
Protein metabolism	27	4/24, 4/29
Regulation of gene expression	28	5/1, 5/6, 5/8

Note: There will be no class on Feb 12th. No classes on April 8, 10, and 15 due to Spring Break. Please note that **Tuesday, April 7th is a Wed schedule**.

CUNY Policy on Academic Integrity

The Policy on Academic Integrity, as adopted by the Board is available to all candidates. Academic Dishonesty is prohibited in The City University of New York and is punishable by penalties, including failing grades, suspension, and expulsion. This policy and others related to candidates' issues are available to you at: http://qcpages.qc.cuny.edu/provost/Policies/index.html.

MCAT rules for clothing will be followed during exams:
"You may not wear hats, scarves, or jewelry (except for religious purposes) during the test. If your clothing has a hood, it must not cover your head at any time."
Cell phones are strictly prohibited for class and exams, and watches are prohibited from exams.