KONKUK University

'2026 International Summer Program

Course Syllabus: Introductory Biochemistry

Subtitle: Nature of Biomolecules

Course Information

- **Course Title:** Introductory Biochemistry: Nature of Biomolecules
- **Program:** 2026 International Summer Program at Konkuk University (KU)
- **Duration:** 11 Days (Summer Session)
- **Language of Instruction:** English

1. Instructor Information

Name	Department / Affiliation	Contact e-mail
Dong-Eun Kim, Ph.D.	Dept. of Bioscience and Biotechnology	dekim@konkuk.ac.kr
Joon Soo Park, Ph.D.	Department of Chemistry	jspark@konkuk.ac.kr

2. Course Materials (Textbooks)

- **Part 1 (Prof. Park):** *Nucleic Acids in Chemistry and Biology* (G. Michael Blackburn, Martin Egli, Michael J. Gait, Jonathan K. Watts)
- **Part 2 (Prof. Kim):** *Biochemistry: Concepts and Connections* (Appling, Anthony-Cahill & Mathews)

3. Course Description & Learning Objectives

This course offers an intensive introduction to the molecular logic of living organisms. Students will explore the structural and functional properties of essential biomolecules.

- (Prof. Kim): Focuses on the fundamental principles of biochemistry, including the properties of water, protein structure-function relationships, and enzymatic catalysis.

- (Prof. Park): Dives into the chemical biology of nucleic acids, exploring DNA/RNA structures and their applications in modern molecular medicine.

4. Assessment

- **Attendance & Participation: 20%**
- **Mid-term Quiz (Covering Part 1, session 1-6): 40%**
- **Final Exam (Covering Part 2, session 7-11): 40%**

5. Class Schedule (11-Day Intensive)

Session	Date	Topic	Lecture contents	Lecturer
1	July 3	The Chemical Foundation of Life	Weak Interactions in an Aqueous Environment	Dong-Eun Kim, Ph.D.
2	July 6	Nucleic Acids Structure	Structure of DNA and RNA	Joon Soo Park, Ph.D.
3	July 7	Genes and Genomes	Genes and human chromosome	Joon Soo Park, Ph.D.
4	July 9	Epigenetic Modification and DNA Replication	Epigenetic modification and DNA replication	Joon Soo Park, Ph.D.
5	July 10	RNA Transcriptoin	RNA Transcriptoin in prokaryotes and eukaryotes	Joon Soo Park, Ph.D.
6	July 13	RNA Processing and Translation	RNA processing and translation	Joon Soo Park, Ph.D.
7	July 14	Introduction to Proteins	The Primary Level of Protein Structure	Dong-Eun Kim, Ph.D.
8	July 16	The Three-Dimensional Structure of Proteins	Secondary Structure, Tertiary Structure, and Quarternay Structure	Dong-Eun Kim, Ph.D.
9	July 17	Protein Function and Evolution	Antibodies, Myoglobin, Hemoglobin, Actin and Myosin	Dong-Eun Kim, Ph.D.
10	July 20	Enzymes: Biological Catalysts	The Kinetics of Enzymatic Catalysis; The Regulation of Enzyme Activity	Dong-Eun Kim, Ph.D.
11	July 21	Carbohydrates and Lipids	Sugars, Saccharides, Glycans, Membranes, and Cellular Transport	Dong-Eun Kim, Ph.D.