Course number	U-LAS14 20035 LE68		
Course title (and course title in English)	Basic Biology-E2 Basic Biology-E2	Instructor's name, job title, and department of affiliation	Graduate School of Biostudies Specially Appointed Professor,HEJNA, James
Group	Natural Sciences	Field(Classification)	Biology(Issues)
Language of instruction	English	Old group	Group B
Number of credits	2		
Number of weekly time blocks	1	Class style	Lecture (Face-to-face course)
Year/semesters	2025 • First semester		
Days and periods	Mon.3	Target year	Mainly 1st & 2nd year students
Eligible students	For science students		

[Overview and purpose of the course]

This class will provide a basic introduction to molecular and cell biology, in English. The class is open to 1st and 2nd year students, and will assume some prior familiarity with elementary chemistry and biology, although students from other majors are welcome to attend. The objective for the class is to nurture an intellectual curiosity about molecular and cell biology, which will lead to more in-depth study later on. We will pay attention to some of the similarities in different organisms, as well as some of the obvious differences, not only between organisms but between cell types, and at the molecular level of protein functions.

[Course objectives]

Students will gain familiarity with the fundamental components of cells, and begin to learn how cellular function depends on complex interactions between proteins, nucleic acids, lipids, and carbohydrates, acting alone, in complexes, or in larger structures, such as organelles. Students should begin to appreciate how fundamental processes are conserved over evolutionary time, and also how they vary in different species.

[Course schedule and contents)]

First Semester, Mondays, 13:00-14:30

1. Big and Small: organisms and molecules
   Weeks 2-9 will introduce the basic parts that build living cells.
2. Carbohydrates
3. Nucleic Acids-DNA, nucleotides, genes, etc.
4. Nucleic Acids-RNA, ribonucleotides, coding RNAs, non-coding RNAs, etc.
5. Proteins: structural proteins, enzymes, machines
6. Information Flow, the central dogma and beyond.
7. Ribonucleoproteins, including ribosomes and protein translation
8. Lipids and membranes: what makes a cell a cell?
9. Membranes: inside, outside, and channels
10. Energy and Metabolism: what is the power source of the cell?
11. Gene Regulation: how are genes turned on and off?
12. Prokaryotic Cells: basic biology and social interactions
13. Eukaryotic Cells: types of cells; cell differentiation; and more
14. Regulation-homeostasis, communication, and signaling
15. Final Exam

Continue to Basic Biology-E2(2)↓ ↓ ↓

Basic Biology-E2(2)

16. Feedback class

[Course requirements]

The class is open to all 1st and 2nd year students, but it assumes some basic (high school) knowledge of chemistry and biology.

[Evaluation methods and policy]

Lectures will encourage student participation. There will be a final exam and some mini-quizzes to assess comprehension. Attendance will also factor into the final grade. Attendance and participation, 50 points; quizzes, 20 points; final exam, 30 points.

[Textbooks]

Asashima et al, Online textbook: A Comprehensive approach to Life Science (English version). URL: http://csls-text.c.u-tokyo.ac.jp/index.html

[References, etc.]

（References, etc.）

Alberts, The Molecular Biology of the Cell. Older editions are freely searchable online on the PubMed/Books website.

I will also refer to a general biology textbook:
Reece, Urry, Cain, Wasserman, Minorsky, and Jackson. "Campbell Biology", 10th edition. Pearson Education, Inc. 2014

I will provide lecture handouts for each class, hopefully one week in advance.

[Study outside of class (preparation and review)]

For some students, the subject will already be familiar, but the English vocabulary will be new. For others, the biological concepts will be new. Thus, outside work may involve a balance of reading about biology and acquisition of specialized biological vocabulary. I may provide some optional homework problems to help you focus on the key concepts.

[Other information (office hours, etc.)]

Office hours: Mondays, 10:00-12:00. I am often in my office, and you are free to drop in--I can always find 5 or 10 minutes to talk about biology.

[Essential courses]