Course	Life Science			Teacher	Masahiko Hirota		
Type of course	Lecture	Credits	2 credits	Semester・Period	1st・2nd year ／Spring	Compulsory ・Elective	Elective

Aim of the Course

This course provides a readily accessible introduction to the central concepts of life science. The aim of this course is to understand and discuss the framework for the basic science that underlies our current understanding of all of life sciences.

	Attainment Target of the Course	Evaluation tool・Method	Ratio of Evaluation
Interest・Motivation・Attitude	To be able to demonstrate achievements of study by giving some presentations	・presentation	20%
Consideration・Judgement	To be able to present a review of the literature	・presentation	25%
Skill・Expression	To be able to discuss about the topics	・discussion	20%
Knowledge・Understanding	To be able to write a short review paper	・description of a review paper	35%
Attendance			Required to take exam
Total Score			100%

Evaluation criteria and supplementary explanation of evaluation means or methods

・ Evaluation: presentation and discussion (65%) and review papers (35%)

Overview of the Course

・ This course requires a review of literature, proposal of a research question, collection and analysis of the data. The final short review paper will be required.

Textbook ・ Reference book

Textbook : related original papers

Reference book : Johnson A, Alberts B, Morgan D, Hopkin K, Roberts K, Raff M, and Walter P: Essential Cell Biology, Garland Science.

Out of class learning and expectations for students

・ This course is conducted in English. Students are expected to have some knowledge of life science.

#	Topic	Details	Preparation・Review
1	Cells	The Fundamental Units of Life	Review “Cells: the fundamental units of life”
2	Cells	Energy, Catalysis, and Biosynthesis	Review “Cells: energy, catalysis, and biosynthesis”
3	Protein	Structure and Function	Review “Protein: structure and function”
4	DNA	Replication and Repair	Review “DNA: replication and repair”
5	From DNA to Protein	How Cells Read the Genome	Review “From DNA to Protein: how cells read the genome”
6	From DNA to Protein	Control of Gene Expression	Review “From DNA to Protein: control of gene expression”
7	Evolution	How Genes and Genomes Evolve	Review “Evolution: how genes and genomes evolve”
8	Genes	Analyzing the Structure and Function of Genes	Review “Genes: analyzing the structure and function of genes”
9	Cell Membrane	Membrane Structure, and Transport Across Cell Membrane	Review “Cell Membrane: membrane structure, and transport across cell membrane”
10	Energy and Food	How Cells Obtain Energy from Food	Review “Energy and Food: how cells obtain energy from food”
11	Mitochondria and Chloroplasts	Energy Generation in Mitochondria and Chloroplasts	Review “Mitochondria and Chloroplasts: energy generation in mitochondria and chloroplasts”
12	Transport and Signaling	Protein Transport and Cell Signaling	Review “Transport and Signaling: protein transport and cell signaling”
13	Cell-Division	The Cell-Division Cycle	Review “Cell-Division: the cell-division cycle”
14	Reproduction	Sexual Reproduction and Genetics	Review “Reproduction: sexual reproduction and genetics”
15	Cellular Communities	Tissues, Stem Cells, and Cancer	Review “Cellular Communities: tissues, stem cells, and cancer
16	Conclusion	General Discussion	Submit a short review paper