

# Biology 1

Syllabus Number 5A105  
Basic Major Subjects  
Requisites 2 credit  
SHINOMURA, Tomoko

## 1. Course Description

This course deals with the following aims to recognize living things as a member of ecosystem of the earth and recall theories expressed in various biological phenomena:

1. To develop a conceptual framework of biological adaptation and diversity explained in the study of evolutionary, ecological, physiological, and molecular analysis.
2. To understand the interaction of organisms, populations, and co-evolution of species in a biological community network and population dynamics.
3. To understand the structure, function and dynamics of a biological community, material cycle and energy flow.
4. To elucidate a law of biological nature in ecological video material.

The aim of this course is to help students acquire the DP1 related knowledge and performance. Group discussion and presentation will be carried out, if necessary.

## 2. Course Objectives

At the end of the course, participants are expected to

- (1) Predict the fundamental properties of life at the individual, population, and community levels.
- (2) Apply such knowledge to the advanced field of biosciences such as evolutionary biology, molecular genetics, and environmental biology.
- (3) recognize and explain biological theories and important information expressed in the figures and tables.

## 3. Grading Policy

Your final grade will be calculated according to the following process: Short-term examination (40%) on LMS, term-end examination (60%). Results of short-term examination will be returned and important points will be summarized in the class.

## 4. Textbook and Reference

Textbook

The Japanese Society of Ecology Ed. (2012) Introduction to Ecology, 2nd Edition (in Japanese)

Tokyo Kagaku Jozin, ISBN 978-4-8079-0783-0

Reference

Edited by Cain M. L., Yoon C.K. and Singh-Cundy A. (2012) Discover Biology Core Topics, 4th edition (in Japanese) Tokyo Kagaku Jozin, ISBN 978-4-8079-0770-0

## 5. Requirements(Assignments)

- (1) Students are expected to read the corresponding sections of the textbook and write down keywords on the notebook prior to each class. (60 min)
- (2) Students should take a conformational test on LMS and review the key points of each class on the notebook. (30 min)

## 6. Note

- A student who feel the progress of lecture is too fast should come and see us soon. We are ready to support you in collaboration with Learning Support Team.
- You are welcome to come and ask questions.
- Please visit my office if a student was absent a class and necessary to obtain the lecture papers.

## 7. Schedule

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|------|---|
| [1]  | Level view of life, Challenges to be solved by human beings   |
| [2]  | Mode of life from an evolutionary point of view (1): Adaptive evolution by natural selection                            |
| [3]  | Mode of life from an evolutionary point of view (2): Theories to understand ecology and evolution                       |
| [4]  | Mode of life from an evolutionary point of view (3): Genes to understand ecology and evolution; Species differentiation |
| [5]  | Mid-term examination, summary and lecture the important points  |
| [6]  | Adaptive evolution of life cycle  |
| [7]  | Ecological and physiological characteristics for adaptation strategy (1): Adaptation of plants to natural environments  |
| [8]  | Ecological and physiological characteristics for adaptation strategy (2): Adaptation of animals to natural environments |
| [9]  | Behavior and society of animals   |
| [10] | Interaction between individuals and population (1): Individual growth, Interspecific competition                        |
| [11] | Interaction between individuals and population (2): Predators and preys; Meta-populations                               |
| [12] | Interaction between individuals and population (3): Fluctuation of populations; Parasitism, Symbiosis                   |
| [13] | Biological communities and their distribution: Network among species interactions; Food chain                           |

- [14] Biological communities and their distribution: Climate and biomes; Plant distribution in Japan
- [15] Structure and function of ecosystem