

## Educational purpose

We foster graduates with the skills and outlook required to become future global leaders, and a strong capacity to discover and solve problems. Students develop a comprehensive understanding of biological phenomena of various organisms including humans, the evolution of the earth and dynamics of the environment, and methods of conservation and sustainable use of biological resources.

# College of Biological Sciences

## ■ Bachelor of Science

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### ■ Educational purpose ■

We foster graduates who can bridge society and advanced sciences, with a well-developed mechanistic understanding of living organisms and biological systems, research methods for biology, and the significance of advanced research. Our graduates are equipped to become researchers, educators, engineers, and business people who are globally active in various academic fields related to biology.

### ■ Desired students ■

The program is designed for creative people with a passion for living things and biology, who have basic academic skills in natural science and language, and a strong curiosity and inquisitiveness regarding a wide range of diverse life phenomena.

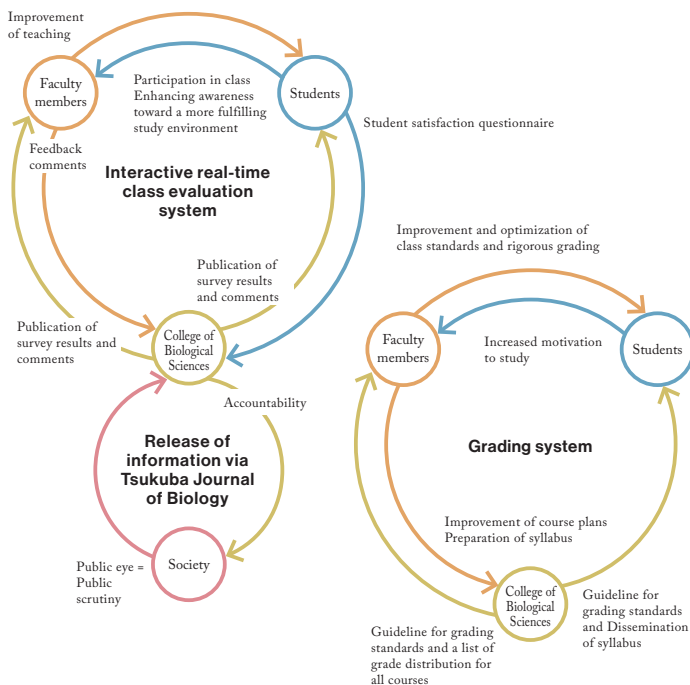
## Measures to ensure and improve the quality of education

By making all students aware of the grading criteria guidelines and syllabus in advance, we aim to motivate students to learn while improving the standards to be achieved. The guidelines assign a grade of B to students who achieve their goals, and an A or A+ to those who are particularly outstanding.

In order to verify whether the assignments in each course were appropriate, a list of grade distributions for all courses offered by the College of Biological Sciences is created on the online academic management system TWINS and shared with all faculty members. In addition, for courses which do not meet the guidelines above, reasons and explanations are sought from the instructor. In this way, an appropriate grading system for the entire college has been established.

All courses offered by the College of Biological Sciences are evaluated by students using the TWINS, an interactive real-time system that allows students to freely write their opinions. These opinions, along with the results of university-wide course evaluation questionnaires are used to further improve the courses. Moreover, evaluations and opinions from students and feedback comments on them from instructors are made public for all courses, and the Curriculum Committee and the Chair of the College provide instruction as needed to improve the quality of education throughout the college.

### Evaluation of course standard and improvement of classes in the College of Biological Sciences



# Bachelor of Science

## Diploma Policy

A Bachelor of Science degree will be awarded to students who have acquired the knowledge and abilities (Generic Competences) in accordance with the educational objectives for undergraduate students of the University of Tsukuba, and who are recognized as having achieved the following goals based on the educational purpose of the School and College.

Understanding of natural science: Students have acquired basic knowledge of natural science, and capacity for scientific thinking.

Understanding of biology: Students have developed a broad understanding of biology, including fields in addition to their field of specialty, and have acquired understanding of various biology research methods.

Ability to analyze biological phenomena: Students have acquired the ability to use appropriate methods to analyze data including “big data” obtained through experiments and observations of biological phenomena, and to accurately describe and critically evaluate them.

International communication abilities: Students have gained sufficient English ability essential for international career growth, and the communication abilities to express their thoughts and opinions accurately and clearly.

Logical expressive abilities: Students have acquired the ability to read academic papers and have gained logical expressive abilities by reading academic papers in English related to the theme of their graduation research and summarizing the content in a report, etc.

Problem discovery and solution abilities: Students have acquired abilities to proactively discover and solve problems through the completion of their graduation research in their final year. Moreover, students have gained competency in scientific expression by presenting their research outcomes and publishing their abstract online.

## Curriculum policy

We organize and implement curricula based on the following policies for programs that allow students to acquire learning outcomes appropriate to Bachelor of Science.

### General policy

We offer subject groups ranging from fundamental biology to advanced fields such as genome biology, as well as neighboring fields involving agriculture and medicine, designed to enable students to learn the extensive field of biology. We foster students' practical and creative abilities by offering numerous laboratory courses, field laboratory courses, and seminars.

### Course sequence policy

During the first year, students develop their basic knowledge of natural science in general, as well as acquiring fundamental knowledge and techniques in general biology through Introductory Subjects and Fundamental Biology Laboratories.

Students choose a field of specialization in their second year, with third year students studying a range of biology major courses both in their specialization as well as other fields. In this way, students acquire a breadth of biological understanding along with specialized knowledge and skills that allow them to engage in graduation research.

In their fourth year, students engage in a graduation research project, which develops their abilities for the proactive discovery and solution of problems, along with skills in the expression of scientific ideas.

### Implementation policy

In addition to Fundamental Biology Laboratories during first year, students are required to take a minimum of four additional specialized laboratory classes during the second and third year, and engage in Graduation Research in their chosen laboratory during the fourth year. In this way, we foster student research abilities.

■ We offer approximately 30 subject classes in English (primarily major subjects for second- and third-year students), to foster student capability for active international roles.

**Policy for evaluation of learning outcomes**

■ We evaluate the achievement of learning outcomes at the curriculum level in a comprehensive and multifaceted manner, using measures of knowledge acquisition such as GPA, outcomes from graduation research, acquisition of qualifications and licenses, career paths, and the like as indicators.

■ We evaluate the achievement of learning outcomes at the subject level in a comprehensive and multifaceted manner, using grade evaluation

based on the attainment of course learning outcomes, learning portfolios, reports, questionnaires and so on as indicators.

**Characteristics**

In order to further strengthen international communication abilities, Science Communication classes in the second and third years and Technical English classes in small groups in the third and fourth years are designated as compulsory courses. Moreover, we offer an exchange program with the University of Manchester, for students who wish to develop their international communication abilities, as a measure to foster graduates with particularly excellent international communication abilities.

**Structure of curriculum and competencies to be developed**

1 <sup>st</sup> year	2 <sup>nd</sup> year	3 <sup>rd</sup> year	4 <sup>th</sup> year
<b>Foundation Subjects for Major</b> Introduction to Systematics and Evolutionary Biology Introduction to Molecular and Cellular Biology Introduction to Genetics Introduction to Ecology Introduction to Animal Physiology Introduction to Plant Physiology Fundamental Biology, Laboratory	<b>Major Subjects</b> <b>Biodiversity Course</b> Better understand the diversity of Organisms, including their systematic classification, evolution and ecology. <b>Computational Biology and Bioinformatics Course</b> This course aims to learn various cutting-edge methodologies to analyze a large amount of data, which has been accumulated for diverse aspects in biology, by using computers. <b>Molecular and Cellular Biology Course</b> Understand the molecular mechanisms of living organisms, including functions of genes, proteins and cells. <b>Applied Biology Course</b> Through the biochemical, molecular biological, and the other biological analyses of life phenomena, students will learn basic knowledge about the functions of molecules that support life, and the methods to chemically control these molecules, as well as techniques for developing and using useful functions of organisms. <b>Human Biology Course</b> Understand the basic principles and laws that control humans, focusing on humans as a single biological species. <b>GloBE (Global Biology in English)</b> By studying each specialized field of biology in cross-disciplinary way, acquire communication and presentation skills in English, as well as abilities to examine the problems, which are essential for international success.	<b>Biology Seminar</b>	<b>Graduation Research</b>
<b>General Foundation Subjects</b>	Technical English		
Qualification acquisition by taking teaching course and course for museum curator.			

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Choose the laboratory