

Educational purpose

To develop global human resources with the extensive knowledge needed to realize a sustainable society, and having specialties from the basics to applications of science and technology, flexibility in thinking, competencies for intellectual creativity with problem finding and solving skills, broad perspectives, enriched sense of humanity, and collaboration skills to work in teams, all with a view to contributing to the international society.

College of Mathematics

College of Physics

College of Chemistry

College of Engineering Sciences

College of Engineering Systems

College of Policy and Planning Sciences

Bachelor's Program in Interdisciplinary Engineering

College of Physics

■ Bachelor of Science

■ Educational purpose ■

We foster personnel who possess the solid foundations and advanced specialized knowledge of modern physics, which is diversely developing. Students also gain flexible thinking ability through the processes of pursuing the truth as well as the capability for getting insights about the true nature of things and thereby solving the actual causes of problems. Utilizing their abilities, they will play an active part in various areas in the society.

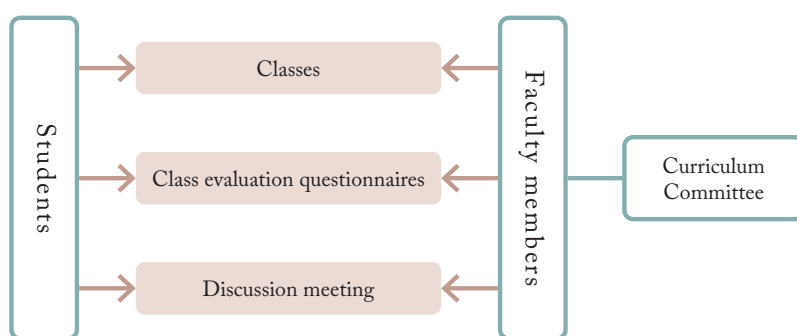
■ Desired students ■

We seek candidates who possess the basic academic abilities in various high school subjects and the ability to further study physics in the university. Students are expected to have a wide perspective of view, learn by themselves, and flexibly deal with unknown matters.

Measures to ensure and improve the quality of education

- **Rigorous grading:** Grading is done rigorously based on exams and reports submitted.
- **Standing Curriculum Committee:** The Curriculum Committee, consisting of approximately 10 faculty members, meets several times each semester to review and improve the classes.
- **Questionnaires for class improvement and discussion meetings between faculty members and students:** Students take the initiative in conducting questionnaire surveys for all the major subjects, and the results of the surveys are made public. Based on the class questionnaires, discussion meetings for students and faculty are held every year for class improvement.

Measures to ensure and improve the quality of education (conceptual diagram)



Bachelor of Science

Diploma Policy

We grant diplomas for Bachelor of Science to persons who have acquired the knowledge and abilities (Generic Competences) to accomplish the educational purpose for undergraduate students of University of Tsukuba. In their learning outcomes, they have achieved the following goals based on the educational purpose of our school and college.

■ Understanding concepts and ways of thinking that are bases for natural science, and abilities to solve problems (Calculus, linear algebra, and courses in Chemistry and Biology, etc.)

(Relevant competences: Understanding natural sciences)

■ Understanding concepts and ways of thinking that are bases for classical physics, and abilities to solve problems (Mechanics, electromagnetics, analytical mechanics, thermodynamics, etc.)

(Relevant competences: Understanding classical physics)

■ Understanding concepts and ways of thinking that are bases for modern physics, and abilities to solve problems (Quantum mechanics, statistical mechanics, relativity, etc.)

(Relevant competences: Understanding modern physics)

■ Understanding concepts and ideas of specialized physics in each field, and abilities to solve problems (Graduation research, physics in each specialized field)

(Relevant competences: Understanding specialized physics)

■ Abilities to implement computer programs and to obtain proper physical insights from numerical results (Graduation research, computational physics)

(Relevant competences: Computational analysis skills)

■ Understanding principles and operation of experiments, and abilities to properly obtain physical meaning from the results (Graduation research, physics experiments, experimental physics, etc.)

(Relevant competences: Ability to analyze experiments)

■ Ability to express and discuss physics content in English and other languages (Graduation research, scientific English, etc.)

(Relevant competences: Professional dialogue skills)

■ Ability to explore and solve problems in physics independently (Graduation research, problem exploration practice seminar, etc.)

(Relevant competences: Problem solving skills)

Curriculum Policy

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

General policy

We organize a systematic curriculum for students to gain basic knowledge related to overall natural science and to effectively acquire specific competence. In order for students to proactively study, we select the most appropriate subject format (lecture, seminar, experiment).

Course sequence policy

Physics has been developed as a process based on what predecessors have built. In this way, new discoveries are accumulated in a repeated manner. The modern physics have been significantly developed and highly specialized in each field. At the same time, basic concepts are universally used in different fields. During the four years in the College, it is necessary to learn in order, starting from classical physics, moving to basic subjects forming a core of the modern physics, then, to highly specialized developing subjects. A standard year of learning is set for each subject.

■ The first year: Students understand classical physics of point mass and fields and widely learn natural science subjects, such as mathematics, chemistry, biology, and earth science.

■ The second year: Students further study classical physics and acquire basic knowledge in quantum mechanics, etc., forming the core of the modern physics.

■ The third year: Students study more advanced topics in modern physics as well as specialized physics.

■ The fourth year: Each student joins a laboratory to study specialized physics and conduct graduation research.

Implementation policy

We offer courses that utilize e-learning to promote active learning, and courses that explore issues to foster creativity. Furthermore, in order to

produce human resources who can conduct research on the international stage, we have established courses taught by foreign faculty members.

Policy for evaluation of learning outcomes

We evaluate learning outcomes based on the status of acquisition of abilities written in the Diploma Policy.

