

## 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 identifying 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

# Bachelor's Program in Interdisciplinary Engineering

## ■ Bachelor of Engineering

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### ■ Educational purpose ■

This program aims to foster the development of global human resources, who by acquiring firm and basic academic skills in mathematics and physics, which form the foundation of engineering education, will be able to understand and analyze any issues in the field of Interdisciplinary Engineering ranging from the micro to macro-scale, from the fundamental perspective, and to find creative solutions.

### ■ Desired students ■

The Interdisciplinary Engineering Program requires admittees to satisfy the following.

- (1) To have motivation for leading the next-generation manufacturing in a Super Smart Society.
- (2) To have the necessary English proficiency to be devoted to studying the engineering field.
- (3) To have basic academic skills in mathematics to study the wide range of engineering field.
- (4) To have aptitude and motivation for studying in the engineering field.

## Measures to ensure and improve the quality of education

Post class surveys are conducted for all courses with an effective questionnaire, and the Curriculum Committee and the FD Committee meet regularly to work on the improvement of education. The survey results and students' comments are used as a feedback for faculty members to improve the courses, and enhance their teaching skills. World standard textbooks are used for all courses in the Foundation Subjects for Major and Major Subjects to maintain the world standard of education. At the same time, the Curriculum Committee reviews the continuity between courses, and course contents as needed.

# Bachelor of Engineering

## Diploma Policy

Diplomas for Bachelor of Engineering will be awarded to those who are recognized as having achieved the knowledge and abilities (that is, Generic Competences) based on the educational purpose of the bachelor's degree program at the University of Tsukuba and the purpose of the human resource development of the college in question. In their learning outcomes for the Bachelor's Program in Interdisciplinary Engineering, they achieve the following goals.

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Students have acquired basic academic skills in mathematics and physics.

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Students are able to understand and analyze any issues related to the Interdisciplinary Engineering field based on the fundamental approach, and are able to creatively solve the same.

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To have the ability of collaboration, as well as abilities for communication and presentation that allow them to play active roles in a multicultural and multidisciplinary team.

## Curriculum Policy

We organize and implement curriculum based on the following policies for the programs that allow students to acquire the academic achievements related to the degree in Bachelor of Engineering.

### General policy

In order to play active roles in the field of modern engineering, which is interdisciplinary over a wide range of different fields, it is essential to have solid basic academic skills in mathematics and physics, which are common foundations in the aforementioned Engineering fields, and to have the ability to solve problems spontaneously and creatively with a cross-disciplinary perspective in cutting-edge science and technology. This program in particular offers the curriculum for fostering such skills and power.

### Course sequence policy

We implement the education focusing on mathematics and physics, that constitutes a foundation for all science and engineering fields, during the first year and the second year. In particular, we set the goal of having students improve their abilities for the use of basic concepts as well as logical ways of thinking through sufficient implementation of practices together with the use of computers. Moreover, students cultivate experiment-based learning and acquire cooperative ability through practical works of fundamental laboratories and advanced laboratories. During the third year, students learn important Major Subjects that form common cores for micro-engineering and macro-engineering. At the same time, all students belong to relevant laboratories and proactively conduct research (PBL). In this way, students foster more profound specialties and creative abilities.

### Implementation policy

We ensure a world level of education using world-standard textbooks for most of the Foundation Subjects for Major, and the Major Subjects related to mathematics and physics. We also conduct practices through use of computers. In this way, we consider fostering of information processing and

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programming abilities. In PBL during the third year and the fourth year, we recommend that students join different laboratories and carry out research in both fields of micro-engineering and macro-engineering. In this way, we foster their interdisciplinary abilities.

**Policy for evaluation of learning outcomes**

In class subjects, we fairly and strictly evaluate homework, assignments, midterm examinations, and final examinations. In this way, we verify the degree of learning achievement. In experiments, practical subjects, and PBL, we evaluate proactive learning performance abilities through experiments, research outcome presentation, and assignment reports, etc.

**Other noteworthy features**

■ In order to foster interaction with Japanese students, international cooperation abilities and Japanese language skills, laboratories and practical subjects are offered as joint courses of the relevant courses in the College of Engineering Sciences and the College of Engineering Systems. First- and second-year students who are interested in research in the most advanced areas are encouraged to participate in the Advanced Research Experience (ARE) program. Participated students are awarded credits upon completion. Students may also graduate early for entry into graduate schools in Japan.