

# School of Engineering

## Educational Objectives

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In line with the Educational Objectives of Osaka University, the School of Engineering engages in education and research to contribute to the sustainable development of human society by cultivating advanced specialized knowledge in engineering and applying such knowledge proactively for practical purposes, based on the belief that “Engineering is a discipline that integrates various fields of science and technologies for the betterment of society.” In so doing, the School of Engineering aims to develop individuals with the ability to create innovative scientific and technical solutions for a sustainable future. To this end, the School of Engineering is committed to nurturing engineers who can play a leading role in society with: (1) a deep understanding of the mechanisms of human society and the natural world based on diverse scientific knowledge and thinking; (2) specialized knowledge and skills in each engineering field; and (3) the ability to apply expertise in engineering for the genuine progress of human society based on broad-based knowledge and critical thinking, design prowess, an international mindset and a strong sense of ethics.

### **Advanced specialized knowledge and outstanding academic expertise**

Acquire advanced specialized knowledge and skills in each engineering field by studying various subjects; foster a substantial and practical understanding of the knowledge through seminars and laboratory works; and deepen academic expertise and develop problem-solving ability by conducting graduation research.

### **Broad-based knowledge and critical thinking**

Acquire a diverse range of scientific knowledge as well as specialized knowledge to foster a deep understanding of the mechanisms of human society and the natural world, and develop thinking skills to propose interdisciplinary research themes based on such knowledge.

### **International mindset**

Acquire an international mindset by learning foreign languages, cultures and science and technology, and develop the ability to apply expertise in engineering for the genuine progress of human society.

### **Design prowess**

Develop the technical skills to deliver the true value of engineering and the ability to use the skills for the genuine progress of human society based on design prowess and a strong sense of ethics.

## **Degree Awarding Policy (Diploma Policy)**

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Under the Diploma Policy of Osaka University, and with a view to developing individuals with the competencies stated in the educational objectives, the School of Engineering confers a Bachelor's Degree in Engineering on individuals who have acquired basic knowledge and skills in engineering by studying general education subjects and basic professional and Academic Major education subjects designated by each of its five divisions, earned the stipulated number of credits, and passed the examinations specified in the Osaka University Undergraduate School Regulations, subject to achieving the following objectives.

### **Advanced specialized knowledge and outstanding academic expertise**

Acquire knowledge and skills in the disciplines critical for engineering, such as mathematics, physics, chemistry and biology.

Acquire basic and specialized knowledge and skills in one's field of specialty.

Acquire the basic ability to conduct research based on specialized knowledge and skills.

### **Broad-based knowledge and critical thinking**

Acquire an extensive understanding of disciplines in engineering in general.

Acquire a strong sense of ethics to use the knowledge in engineering for the genuine progress of human society.

### **International mindset**

Acquire sufficient foreign language proficiency and an international mindset to play an active role in global society.

Acquire the ability to understand various problems that face human society and different foreign cultures.

### **Design prowess**

Develop an understanding of the role of engineering to contribute to the security, safety and prosperity of human society and acquire engineering-based design prowess.

Acquire theoretical thinking, communication skills and problem-solving skills required for conducting research.

Acquire the ability to appropriately organize one's research and present research results.

## **Teaching and Learning Policy (Curriculum Policy)**

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In line with the Curriculum Policy of Osaka University, the School of Engineering aims to develop individuals who meet the objectives stated in its educational philosophy by offering an integrated educational program that consists of: common general subjects to acquire a diverse range of knowledge to foster a deep understanding of the mechanisms of human society and the natural world; specialized subjects to acquire advanced specialized knowledge and design prowess to put such knowledge into practice; and various other subjects to develop social skills, such as communication skills, logical thinking and an international mindset.

### **Principles of Curriculum Design**

The School of Engineering has five divisions, where students are guided to gain specialized knowledge that covers a relatively wide range of topics, while studying Liberal Arts education subjects to acquire the knowledge and skills specified in the Diploma Policy. Then students are assigned to one of 16 departments/courses where they study advanced Liberal Arts and advanced Global Literacy education subjects along with advanced Academic Major education subjects to acquire broad-based knowledge and critical thinking, as well as academic expertise.

**First year:** Students study Liberal Arts education subjects to acquire broad-based knowledge and critical thinking as basic requirements for responsible members of society, and Academic Major education subjects to acquire a broad range of basic knowledge in the specialty of one of the five divisions with which one is affiliated.

**Second and third years:** Students are assigned to one of the 16 departments/courses to acquire basic and specialized knowledge and skills in respective specialties. Students mainly study principles and theories in lecture-based and seminar-based Academic Major education subjects, while engaging in practical training and laboratory works for empirical hands-on learning through to the third year.

**Fourth year:** All students are required to study engineering ethics to recognize the social responsibility of engineers and develop a strong sense of ethics. The ultimate goal of the curriculum is successful completion of graduation research through laboratory-based in-person research guidance. Students may study abroad on a semester basis under an academic partnership between Osaka University and foreign universities if they wish.

### **Contents and Methods of Education**

Students study: “A Door to Academia,” basic Liberal Arts education subjects, informatics education subjects, Health and Sports education subjects, multilingual education subjects, and professional basic education subjects, which are offered as general education subjects. These subjects include laboratory works in physics, chemistry, and biology, through which students acquire broad-based knowledge and critical thinking, as well as basic expertise. Academic Major education subjects are taught in the form of lectures, seminars and laboratory work in a manner suited to the nature of each specialty. Some subjects employ active learning methods, such as the small-group and problem-based learning (PBL) methods. Students also study advanced Liberal Arts and advanced Global Literacy education subjects to acquire broad-based knowledge and critical thinking, as well as an international mindset.

### **Academic Performance Evaluation Method**

To develop individuals with the ability to think from a comprehensive perspective to identify issues to be addressed on one’s own, and play a leading role in society with advanced engineering-based design prowess, the School of

Engineering evaluates the academic performance of students based on examinations and reports for lecture-based subjects, and reports and oral examinations for seminar-based and practical training-based subjects. Students should attain at least 60% in each subject to earn the credits.