理 Faculty of Engineering

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【Education purpose and ability and aptitude necessary for learning after admission】

The Faculty of Science and Engineering aims to cultivate human resources who have a specialized knowledge of science and technology that can be active in a wide range of fields from a multifaceted perspective based on a wide range of liberal arts, science, and engineering fundamentals. In order to realize this, students will take an education system of 12 courses in one department, prepare basic academic ability in common lectures in the 1st year, and receive divided education for each desired specialty by the 2nd year course assignment. The following shows the curriculum organization for the science and engineering department, the ability and aptitude at the time of admission necessary to adapt to this curriculum, and the learning activities at high schools which are required of applicants for admission.

Science and Technology Department

In the department of science and technology, the purpose is to develop human resources who can be active in their career. By gradually progressing from basic subjects to specialized subjects, you acquire a wide range of basic knowledge in the academic fields of science and engineering and specialized knowledge in each academic field, you also have a wide-ranging social perspective with compound perspectives. For this reason, specialized education is broadly divided into undergraduate courses for acquiring basic academic ability and literacy in the science and engineering fields, and specialized courses offered individually in each specialized field. Curriculum development including liberal arts education, the ability and aptitude at the time of admission necessary to adapt to this curriculum, and the approach of learning in high school which are required for applicants for admission are as follows:

Curriculum Format	Ability and aptitude at the time of admission necessary to adapt to the curriculum
General Education Courses	In order to acquire basic knowledge on nature, culture, and society, to acquire a wide range of knowledge and ideas beyond specific subjects and subjects related to specialization, and to take foreign language subjects (English), you need basic English language skills.
Interface Subjects	It is necessary to have a proactive behavior and learning attitude to carry out active learning. This includes not only an interest in contemporary tasks and events, but also group learning and presentations among students, in order to acquire the ability to identify and solve problems while being conscious of connections with problems in contemporary society.
Undergraduate Common Basic Subjects	In order to acquire the basic literacy required of science and engineering personnel, in addition to basic knowledge, a sense of ethics and an independent, responsible sense of behavior are required. Also, in order to learn problem solving abilities and gain many perspectives through PBL learning, it is necessary to have both a collaborative and a self-directed learning attitude.
Field-specific Specialized Subjects	It is necessary to have a basic understanding of math and the mathematic related subjects of physics and chemistry to be taken at high school, as well as have an interest in the fields of science and engineering, in order to acquire common basic academic ability as a science and engineering department.

Common Course	As a preparatory stage to be divided into specialized courses, in order to acquire specialized knowledge in accordance with the characteristics of each specialized field, basic understanding and science of mathematics, physics, chemistry and other subjects in mathematics, physics, and chemistry, it is necessary that you have an interest in the field of engineering.
Professional Subjects (By Course)	Refer to the special subject curriculum formation etc according to the course.
Graduation Study (By Course)	Refer to the special subject curriculum formation etc according to the course.

〈High school subjects that applicants should study〉

In order to understand the concepts and rules to be learned in the science and engineering field, their applications and technological innovations, the ability to use basic academic skills based on mathematics, physics and chemistry, which are the foundation of science and engineering fields, and these in specialized fields, is required. To that end, it is essential to have a basic understanding of mathematics to be taken at high school. Furthermore, understanding the basic concepts, principles, and laws of natural sciences and cultivating scientific views of nature leads to a broadening of the perspective of learning. Therefore, it is desirable to have textbook level knowledge about mathematics and science studied in high school. On the other hand, it is common to write many reports at universities as well as specialized subjects. Writing a report requires reading and writing skills and social common sense. Therefore, it is necessary to have basic Japanese language and social skills, which should be learned in high school. Furthermore, not only Japanese literature but also English literature, etc. are learned in a seminar format, so it is required that you not only possess basic English reading skills but also that you get in the habit of reading English sentences by checking dictionaries etc.

In addition to the above, we welcome students who have a “self-directed attitude” who can activate the education and research activities of this department by providing good stimulation to surrounding students through their own learning activities and initiatives, etc.

The curriculum formation of specialized education for each course and the ability and aptitude at the time of entrance necessary to adapt to the curriculum, and the approach of learning in high school etc. which are required of applicants for admission are as follows.

Mathematical Science Course (Field of Mathematics)

In the mathematical science course, we acquire specialized knowledge in the field of science centered on mathematics, and foster human resources who can play an active part in society as a whole. For this purpose, the curriculum format of specialized education and the ability and aptitude at the time of admission necessary to adapt to this curriculum, and the approach of learning in high school etc. required of applicants for admission are as follows.

Curriculum Format	Ability and aptitude at the time of admission necessary to adapt to the curriculum
Special subjects (required)	A basic understanding and application of mathematics in high school is essential to acquire the basic idea and logical rigor of mathematics. Also, even in the form of lectures, training outside of class and homework will be assigned, and at the same time knowledge will be tested by performing quizzes and mid-term exams, so a regular learning habit is necessary.
Specialized subjects (elective)	A basic understanding and application of mathematics in high school is essential to understand mathematical thinking, expression and logic in mathematics. In addition, even in the case of a lecture format, regular learning habits are necessary, as studying outside class and homework is assigned, and small tests and mid-term exams are conducted to establish knowledge.
Graduation research	Based on the learning results up to the third year, you will learn the ability to correctly understand and cope with the various problems facing society, so it is assumed that you can learn enough in the curriculum up to the third year. In addition, since graduation research is conducted in a small group format, it is effective to have the ability and attitude to activate learning and research activities by actively participating in discussions and communicating with those around you.

〈High school subjects that applicants should study〉

In order to learn mathematical concepts and logical strictness, it is necessary to acquire basic concepts and methods of mathematics such as differential integration, linear algebra, and sets and phases. In order to do so, it is essential to have a basic understanding and application of mathematics in high school. In addition, understanding the basic concepts, principles, and laws of natural sciences and cultivating scientific views of nature will lead to a broadening of the perspective of learning. Therefore, it is desirable to have textbook-level knowledge of science studied in high

school. On the other hand, it is common to write many reports at universities as well as specialized subjects. Writing a report requires reading and writing skills as well as social common sense. Therefore, it is necessary to have basic Japanese language and social skills to study in high school. Furthermore, not only Japanese literature but also English literature etc. will be studied in a seminar format, so it is necessary not only to have basic English reading skills but also to get in the habit of reading in English by checking dictionaries etc. .

Intelligent Information Systems Engineering Course / Information Network Engineering Course (Information Field)

In the Intelligent Information Systems Engineering Course and Information Network Engineering Course, which make up the information field, we develop human resources who can play an active role in this society (regional society, international society, industry, etc.) with the expertise and ability in intelligent information systems engineering or information network engineering, broad vision and judgment.

For that purpose, the curriculum formation and the ability and aptitude at the time of admission necessary to adapt to this curriculum and the learning activities at high schools etc. which are required of applicants for admission are as follows.

Curriculum Format	Ability and aptitude at the time of admission necessary to adapt to the curriculum
Specialized subject (Intelligent Information Systems Engineering Course)	In order to acquire basic knowledge and skills in the field of intelligent information systems engineering, it is essential to have a basic understanding and application of mathematics in high school. In addition, team work and problem-solving learning are conducted through exercises and experiments so that students acquire the required ability to discover and solve problems as a professional in the information technology field.
Specialized subjects (Information Network Engineering Course)	In order to acquire basic knowledge and skills in the field of information network engineering, it is essential to have a basic understanding and application of mathematics in high school. In addition, team work and problem-solving learning are conducted through exercises and experiments in order to acquire the ability to discover and solve problems as a professional in the field of network technology and problem-solving type learning. Communication skills are required.
Graduation research	Based on the learning results up to the third year, in principle, each student is in charge of individual research themes, and it is specialized by making a research plan from planning to implementation / consistent reporting of results at presentation meetings. The graduation thesis is considered the overall culmination of study. Therefore, it is assumed that you have learned enough in the curriculum up to the third year. In addition, since graduation research is conducted in a small group, it is necessary to have the ability to actively engage in discussion and to have the ability to activate learning and research activities through communication with those around you.

〈High school subjects that applicants should study〉

In the information field, students learn various specialized subjects related to intelligent information systems engineering and information network engineering so that they can play an active part in the forefront of society. In addition to developing documents, oral presentations, and technical English skills, they will also foster cooperation among groups, voluntary learning skills, information gathering skills, etc. through experimental subjects and graduation studies. In order to do this, it is necessary for students to have sufficient basic academic skills in mathematics and science (physics and chemistry) at the time of admission. They also need to have basic knowledge of Japanese, English, and society. The basic thinking, judgment, and expressive skills required are also important for cultivating the ability to find and solve problems. Students should always be interested in events related to information technology, and have a will to work in these fields. In high school studies, students are required to have the ability to solve textbook level problems. In addition, acquire knowledge and skills to utilize information and information technology, cultivate scientific views and ideas on information, understand the role and influence that information and information technology plays in society. It is also necessary to acquire the ability and attitude to be able to respond independently to the progress of computerization. We also expect that all students, regardless of gender, have high motivation for learning and are active in acquiring knowledge.

Life Chemistry Course / Applied Chemistry Course (Chemistry)

Curriculum Format	Ability and aptitude at the time of admission necessary to adapt to the curriculum
Specialized subject (Life Chemistry Course)	In order to acquire knowledge of life chemistry and molecular biology systematically, lectures are arranged around specialized subjects to give students understanding and practical skills, mainly on 5 areas: inorganic chemistry, organic chemistry / life chemistry, physical chemistry, analytical chemistry, chemical engineering. Therefore, it is essential to have a basic understanding and application of chemistry to be taken at high school.In addition, in order to acquire the ability to discover and solve problems as a biochemistry field professional and to acquire coordination and leadership leading to problem solution, team work and problem-solving learning are conducted through exercises and experiments. You need to be proactive and have the ability to communicate with other students.

Specialized subject (Applied Chemistry Course)	In order to acquire knowledge in the field of material chemistry systematically, lectures are arranged around specialized subjects to give students understanding and practical skills, mainly on 5 areas: inorganic chemistry, organic chemistry / life chemistry, physical chemistry, analytical chemistry, chemical engineering. In order to acquire knowledge in the field of material chemistry and material chemistry systematically, lectures on specialized subjects that mainly apply to material chemistry, inorganic chemistry, organic chemistry, physical chemistry, analytical chemistry, chemistry It will be organized and arranged in five areas of engineering to gain understanding and practical skills. Therefore, it is essential to have a basic understanding and application of chemistry to be taken at high school. In addition, as a professional in the field of materials chemistry, in order to gain the ability to discover and solve problems, and to acquire coordination and leadership that lead to problem solving. Because you will do team work and problem-solving learning through exercises and experiments, you need to have an active ability to communicate with other students.
Graduation Research	Based on the learning results up to the third year, under the supervisor of each course, in order to acquire the ability to plan and carry out the work by comprehensive learning, it is assumed that you have learned enough in the curriculum up to the third year to carry out the research. In addition, since graduation research is conducted in small groups, it is effective to have the ability and attitude to activate learning and research activities by actively participating in discussions and communicating with the surroundings.

The life chemistry course and applied chemistry course that make up the chemistry field foster human resources who can continuously contribute to society through chemistry. For that purpose, the curriculum format and the ability and aptitude at the time of admission necessary to adapt to this curriculum and the learning activities at high schools etc. which are required of applicants for admission are as follows.

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〈High school subjects that applicants should study〉

In chemistry, in order to clarify the relationship between the structure and function of various substances and materials, we investigate them in detail and carry out synthesis and analysis of new substances. Therefore, the characteristics of the existing substance can be accurately understood, necessary hypotheses and verification experiments, and a logical explanation of the obtained results are required. In order to study chemistry specially in this way, it is necessary to have a thorough understanding of the basics of chemistry studied in high school.

In addition, data analysis obtained through experiments requires computational power and mathematical thinking, and knowledge of physics and biology is required to understand physical and biochemical properties of substances. Therefore, the basic academic skills of mathematics, physics, and organisms studied in high school are indispensable for a specialized understanding of chemistry. Furthermore, in order to acquire new knowledge and technology, it is necessary to read foreign documents etc., and basic English reading skills are required. On the other hand, not only specialized subjects but also university lectures and exercises require information gathering ability and document preparation ability such as collecting information, reading documents and preparing reports, so basic knowledge of the Japanese language and society to be studied in high school are necessary.

Physics Course (Field of Physics)

The Physics course is designed so that students acquire specialized knowledge in the field of physics centered on physics and is also designed to foster human resources who can play an active part in society. For that purpose, the curriculum format and the ability and aptitude at the time of admission necessary to adapt to this curriculum, and the learning activities at high schools etc. which are required of applicants for admission are as follows.

Curriculum Format	Ability and aptitude at the time of admission necessary to adapt to the curriculum
Specialized subjects (required)	In order to acquire the basic idea and logical strictness of physics, it is essential to have a basic understanding of and the ability to apply physics learned in high school. In addition, even in the case of a lecture format, regular learning habits are necessary because it is intended to establish knowledge by assigning homework and conducting quizzes and mid-term exams. In experiment and exercise focused classes, work related to group learning and experiments is at the core, so it is necessary to have the ability to act independently and communicate with other students.
Specialized subjects (elective)	In order to understand logic in the fields of thinking, expression and mathematics in physics, it is essential to have a basic understanding and application of physics in high school. In addition, even in the case of a lecture format, regular learning habits are necessary because out-of-class learning and homework are assigned, and small tests and mid-term exams are conducted to establish knowledge. In experiments and exercise focused classes, work related to group learning and experiments is at the core, so it is necessary to have the ability to act independently and communicate
Graduation Research	Based on the learning results up to the third year, you will learn the ability to correctly understand and cope with the various problems facing society, so it is assumed you can learn enough in the curriculum up to the third year. In addition, since graduation research is conducted in a small group format, it is effective to have the ability and attitude to activate learning and research activities by actively participating in discussions and communicating with those

〈High school subjects that applicants should study〉

In order to understand basic concepts and rules in physics, not only understanding and computing ability of basic matters of physics and mathematics to be taken in high school, but also logical thinking ability based on your knowledge is required. You also need insight to find the rules through experiments and observations. Furthermore, in order to acquire specialized knowledge and ideas, it is necessary to read foreign literature, and English textbook reading skills at high school are required. On the other hand, not only specialized subjects but also university lectures and exercises require information gathering ability and document preparation ability such as collecting information, reading documents and preparing reports, so basic knowledge of Japanese language and society to be studied in high school are necessary.

Mechanical Energy Engineering Course / Mechanical Design Course (Mechanical Engineering)

The Mechanical Energy Engineering Course and Mechanical Design Course, which constitute the mechanical engineering field, cultivate personnel who will become engineers who have acquired specialized basic knowledge, their applied abilities, and manufacturing basics in the field of mechanical engineering. For that purpose, the curriculum format and the ability and aptitude at the time of admission necessary to adapt to this curriculum and the learning activities at high schools etc. which are required of applicants for admission are as follows.

Curriculum Format	Ability and aptitude at the time of admission necessary to adapt to the curriculum
Specialized subject (Mechanical Energy Engineering Course)	In order to acquire basic knowledge and skills on energy engineering, it is essential to have a basic understanding and application of mathematics and physics in high school. In addition, in order to acquire the ability to discover, search and solve problems through machine design and drafting for actual manufacturing from the viewpoint of energy engineering, team work and problem-solving learning are conducted through exercises and experiments. Therefore, students need to have the ability both to act independently and communicate with other students.

Specialized subject (Mechanical Design Course)	In order to acquire basic knowledge and skills in system engineering, it is essential to have a basic understanding and application of mathematics and physics in high school. In addition, team work and problem-solving learning are conducted through experiential learning including exercises and experiments, etc., in order to learn the problem finding and solution ability to cope with the problems and needs that companies etc. have in the production field. Therefore, it is necessary to have the ability to take initiative and communicate with other students.
Graduation research	Based on the learning results up to the third year, under the supervisor of each course, in order to acquire the ability to find and solve problems in the real society through comprehensive learning, it is assumed that you can sufficiently learn in the curriculum up to the third year. In addition, since graduation research is conducted in a small group format, it is necessary to have the ability and attitude to activate learning and research activities by actively participating in discussions and communicating with those around you.

〈High school subjects that applicants should study〉

Mechanical engineering is an indispensable technology for all manufacturing, and it is the study that will be the basis of various industrial problems that will continue to be important. In order to master it, it is necessary to understand the basics of mathematics, physics and chemistry to be studied in high school, and to have sufficient ability to solve basic problems at textbook level. In addition, understanding of lectures on mechanical engineering, preparation of reports, and presentations require Japanese language skills such as reading and writing skills, and general knowledge learned in social studies such as world affairs, history, and culture. In addition, basic English skills such as reading and writing in English and communication are indispensable to be active in various fields in the future. We hope you to have an interest and enthusiasm for contributing to society through manufacturing through mechanical engineering.

Electrical Energy Engineering Course / Electronic Device Engineering Course (Electronics)

The Electrical Energy Engineering Course and the Electronic Device Engineering Course have the expertise, ability, broad perspective and judgment of electrical and electronic engineering, and in cooperation with others, cultivate human resources who can be active in the local community, international society, industry, etc. The following shows the curriculum format and the ability and aptitude necessary for the adaptation of this curriculum, and the contents that we want applicants to work on in high school learning etc.

Curriculum Format	Ability and aptitude at the time of admission necessary to adapt to the curriculum
Specialized subject (Electrical Energy Engineering Course)	The Electrical and Energy Engineering Course teaches basic expertise in electrical and electronic engineering such as electromagnetism, electrical circuits, and electronic circuits, and the generation, conversion, and use of electrical energy. In order to acquire this basic knowledge and these skills, it is necessary to have the understanding and application skills of mathematics and physics. In addition, in the electrical and electronic engineering experiment, students learn practical ability of PDCA (Plan → Do → Check → Action) cycle and perform team work and problem solving type learning. You need to be able to communicate with those around you.
Specialized subject (Electronic Device Engineering Course)	In the Electronic Device Engineering Course, students will learn basic expertise in electrical and electronic engineering such as electromagnetism, electrical circuits and electronic circuits, physical properties of semiconductors, principles of electronic devices, and applications to electronic engineering. In order to acquire this basic knowledge and these skills, it is necessary to have the understanding and application skills of mathematics and physics. Also, in the electrical and electronic engineering experiments, students learn practical ability of PDCA (Plan → Do → Check → Action) cycle and perform team work and problem solving type learning. Communication skills are required.
Graduation research	In principle, each student is in charge of individual research themes based on the learning results up to the third year, and from the planning of the research plan to the implementation, the report of results at the presentation meeting, the graduation thesis, is the culmination of study. For that purpose, it is assumed that you have learned enough of the contents of the curriculum up to the third year. In addition, in order to carry out graduation research in a small group format, it is necessary to have the ability and attitude to actively advance learning and research activities through an attitude of actively participating in discussions and communication with those around you.

〈High school subjects that applicants should study〉

In the field of electrical and electronic engineering, students learn various specialized subjects related to electrical and electronic engineering so that they can play an active part at the forefront of society. In addition to developing documents, oral presentations, and technical English skills, they will also foster group collaboration, voluntary learning skills, and information gathering skills through experimental subjects and graduation studies. In order to do this, it is necessary for students to have solid basic academic skills in mathematics and sciences (physics and chemistry) at the time of admission, and students are required to have textbook level knowledge. You also need to have basic knowledge of Japanese, English, and society. The basic thinking, judgment, and expressive skills necessary to develop the ability to find and solve problems are also important. Students should always be interested in events related to electrical and electronic engineering, and it is essential to have a willingness to work in these fields.

Urban Infrastructure Engineering Course / Architectural Environment Design Course (Urban Engineering)

The Urban Infrastructure Engineering Course and the Architectural Environment Design Course, which make up the urban engineering field, enables students to acquire specialized knowledge and skills in the field of urban engineering, and develops human resources who can contribute to the sustainable development of cities and regions. For that purpose, the curriculum format and the ability and aptitude at the time of admission necessary for adapting to this curriculum and the learning activities at high schools etc. which are required of applicants for admission are as follows.

Curriculum Format	Ability and aptitude at the time of admission necessary to adapt to the curriculum
Specialized subject (Urban Infrastructure Engineering Course)	In addition to basic knowledge, analysis, and thinking about social infrastructure engineering, students will acquire advanced knowledge and skills to further enhance the environmental infrastructure of safe and secure cities and areas and enrich the environmental infrastructure of cities and areas. In order to do this, it is essential to have a basic understanding and application of mathematics and physics to be taken in high school. Also, in order to acquire the task finding ability and problem solving ability as a professional in the field of social sciences engineering, team work and problem solving type learning are conducted through exercises and experiments. Communication skills are required.
Specialized subject (Architectural Environment Design Course)	In order to acquire the ability to plan and design architectural and urban spaces that correspond to modern society, as well as basic knowledge, analytical ability, consideration ability of architectural city design, knowledge and skills to keep the comfort of the living environment and the building environment around oneself optimally The basic understanding and applied power of mathematics and physics in high school is indispensable. In addition, because it is necessary to acquire the ability to understand various values from a professional viewpoint concerning the history, the culture, and the tradition, and to present the ideal way of building and the urban space for the sustainable development of the city and the region, it is necessary to have a basic understanding of a wide range of subjects such as history, the language to be taken in high school, and geography. In addition, in order to acquire the ability to find problems and solve problems as professionals in the field of architectural urban design, we conduct team work and problem-solving learning through exercises and experiments. You need to have a proactive ability to communicate with other students.
Graduation research	Based on the learning results up to the third year, under the supervisor of each course, in order to acquire the ability to find and solve problems in the real society through comprehensive learning, it is assumed that you will have learned sufficiently from the curriculum up to the third year. In addition, since graduation research is conducted in a small group format, it is necessary to have the ability and attitude to activate learning and research activities by actively participating in discussions and communicating with those around you .

〈High school subjects that applicants should study〉

The maintenance of social infrastructure and buildings in the city and securing of security and security are very important, but at the same time harmony with the natural environment, history, climate, etc. is also necessary. In the area of urban engineering, we also study the understanding of cities and regions, as well as designs that deal with forms and spaces, so students need to be interested in various social events and cultures and history. Therefore, to gain an eye for the basic skills of natural science such as mathematics / physics studied in high school, the language ability to support logical thinking, the English ability for understanding the literature written in English, and the culture and history of the region, we hope that students learn basic social knowledge etc.