For entrants in AY 2024

Appended Form 1

Specifications for Major Program

Name of School (Program) School of Engineering Cluster 2 (Electrical, Electronic and Systems Engineering)

Program name (Japanese)	
(English)	Program of Electrical, Systems and Information Engineering

1 Academic degree to be acquired: Bachelor's degree in engineering

2. Overview

(1) Overview of "English-based Bachelor's Degree Program"

This program aims to foster and produce future members of a global society who have the knowledge to be innovative, creative, take leadership, and possess language abilities that will help them play an important role in the international world.

This program focuses specifically on producing individuals who are capable of addressing various global issues from an engineering perspective and contribute to the creation of new and valuable solutions that are significant to both the industrial and academic societies.

Students enrolled in the program will begin the curriculum from the first semester of their first year. In the second year, students will set off on their major programs and take the designated courses which are offered at each cluster. Major program overview is as (2).

(2) Program overview of "Program of Electrical, Systems and Information Engineering".

In the fields of electricity, electronics, systems, information, and in other related fields, technological innovation has been advancing rapidly. We are now in a situation where technological innovation, ideas, and theories are being produced not only by deepening expert knowledge in a specific area, but by combining expert knowledge from multiple fields. As the impact of such technology on society is getting greater, it is always necessary to keep in mind the relationship between humankind, society, and nature.

On the basis of these social trends, Cluster 2 in the School of Engineering (Electrical, Electronic and Systems Engineering) has prepared the following programs with the aim of developing professionals who have a wide range of perspectives and insights, a sense of responsibility, and an ethical outlook, as well as specialized technological, problem-analyzing, and problem-solving abilities.

The Program of Electrical, Systems and Information Engineering

The Program of Electronic Devices and Systems

Except for in exceptional circumstances, students who are enrolled in Cluster 2 in the School of Engineering (Electrical, Electronic and Systems Engineering) can choose one of the above two options for this program at the start of the second year, after going through liberal arts education and specialized education for one year after enrollment.

The Program of Electrical, Systems and Information Engineering develops professionals who have acquired a broad basic knowledge and the technical expertise related to electrical and electronic circuits, electric energy, measurement control, system planning management, and information processing required for system construction, as well as the ability to solve complicated problems in a highly informatized society, and to take the lead in future technological innovation on their own initiative.

To that end, this program offers a curriculum in which students can learn, comprehensively and systematically, the specialized subjects related to electricity, systems, and information, from the basics to practical application. In concrete terms, students study mathematics, electric circuits, technical English, programming that is commonly used in all fields related to electricity, systems and information, experimentation, practicum, and introductory subjects such as "specialized basic subjects". These are studied mainly in the first and second years, and enable students to acquire a broad range of knowledge and a wide field of vision. From the second year to the fourth year, students can systematically acquire the knowledge and applied skills required in each field by taking combined "specialized subjects" classified into the six fields of physical engineering, electric circuits and energy, measurement

control, system planning management, computing, and mathematical information. Specialized basic subjects and specialized subjects are designed for students to be able to acquire specialization and a broad range of knowledge. Consideration is given to ensuring that students have a degree of freedom in choosing their future career path.

This program has prepared a curriculum through which students can acquire the qualifications below. If students complete the designated subjects, they are exempted, wholly or in part, from the applicable national examination for the acquisition of these qualifications.

Type-1 High School Teaching License (Industry) (mastery of teaching related subjects is required)

Electrical Chief Engineer (some years' work experience after graduation is required)

Engineer for Architectural Equipment (Qualification of candidacy for an exam is given to those who gain two or more years' experience after graduation.)

3. Academic Awards Policy (Goals of the Program and Policy for Awarding Degrees)

The Program of Electrical, Systems and Information Engineering develops professionals who have a broad perspective, insight, a sense of responsibility, and an ethical outlook, as well as expertise, technical knowledge, and the ability to analyze and solve problems.

To that end, this program covers the fields of electricity, systems, and information, and offers an education that deals with "electricity" in a comprehensive way, from the two perspectives of electricity as a thing in itself, and of the abstract concept of electricity, systems, and information. By providing everything, from the basic concepts to cutting-edge knowledge, in each field and, furthermore, identifying the mutual relationships between the fields in a systematic manner, this program aims at developing professionals who can take the lead in engineering development in these fields, and who have the ability to develop innovative technology by synthesizing the different fields, which is of growing importance for the future.

This program awards a bachelor's degree in engineering to students who, in addition to the number of credits necessary to meet the standard of the course, have acquired the following knowledge and abilities:

Goal A　Acquisition of the ability to recognize the relationship between science and technology, and humankind, society, and the natural environment, from various perspectives, and the ability to understand the responsibilities engineers have for society.

Goal B　Acquisition of the basic knowledge commonly required in the field of electronic systems and information, and the abilities applicable to the field.

Goal C　Acquisition of the ability to analyze given challenges by using expertise, and draw solutions that meet the requirements of society.

Goal D　Acquisition of the ability to draw up plans and measures to resolve challenges, and the will to carry these measures out.

Goal E　Acquisition of the ability to gather information and to communicate in Japanese and English. Acquisition of the ability to sum up one's thoughts and accomplishments, to write logically, and to give a presentation.

4. Curriculum Policy (

Basic knowledge of mathematics, such as differential and integral calculus, and linear algebra, required by scientists and engineers (Goal B). This is obtained through mastery of such fundamental subjects as “Calculus” to be offered in the first year.

students must acquire a total of 34 or more credits in liberal arts education subjects and specialized education subjects by the end of the first year.

6. Qualifications to be Acquired

By mastering the predetermined courses, students can obtain Type-1 High School Teaching License (Industry)

Students qualify as electrical chief engineers and engineers for architectural equipment after having hands-on experience for some years after graduation. The details are given in student handbook.

7. Class subjects and course content

* For class subjects, see the course list table on the attached sheet.
* For course content, see the syllabus for each academic year.
* All courses are taught in Japanese. Course materials may be written in both Japanese and English or only English.

8. Academic Achievements

At the end of each semester, the evaluation criteria are applied to each evaluation item of academic achievement to clearly demonstrate the level of attainment. Students' grade calculation for each subject from admission to the current semester is given in one of three levels: "Excellent," "Very Good," and "Good," based on evaluation criteria calculated by adding the weighted values to the numerically-converted values of their academic achievements (S = 4, A = 3, B = 2, and C= 1) in each subject being evaluated.

Evaluation of academic achievement	Converted values
S (Excellent: 90 points or higher)	
A (Superior: 80-89 points)	
B (Good: 70-79 points)	
C (Fair: 60-69 points)	1

Academic achievement	Evaluation criteria
Excellent	3.00 4.00
Very Good	2.00 2.99
Good	1.00 1.99

* See the relationship between evaluation items and evaluation criteria in the attached sheet 2.
* See the relationship between evaluation items and class subjects in the attached sheet 3.
* See the curriculum map in the attached sheet 4.

9. Graduation Thesis (Graduation Research) (Positioning, When and how to be assigned, etc.)

Graduation work aims at imparting general research skills by conducting research in line with the research agenda established for each student. The following are more concrete goals:

(1) The acquisition of the ability to make a research plan based on the research agenda and execute the research in accordance with the plan

(2) The acquisition of the ability to collect materials related to the research agenda, demonstrate a deep understanding of the research agenda, and identify problems

(3) The acquisition of the ability to analyze the problems in the research agenda and reach solutions in accordance with the requirements of society

(4) The acquisition of the ability to read, write, converse, and retrieve information in the English language necessary for conducting research

(5) The acquisition of the ability to organize research results and write in coherent sentences the significance and validity of the obtained outcomes

(6) The acquisition of the ability to present the research outcomes and discuss them verbally in an easy-to-understand manner

The requirements for embarking on a graduation thesis are as described in student handbook. Students in the fourth year or over, who satisfy the requirements for embarking on a graduation thesis, are to be assigned as requested. How adjustments are made in relation to assignment is explained to the applicable students at a briefing

held in advance. A briefing session about research topics or an open laboratory is held around the time from February to April for students who are to be assigned to the research laboratory and to the program.

10. Responsibility System

(1) PDCA Responsibility-taking System (“Plan,” “Do,” “Check,” and “Act”)

This Program is operated by teachers who support the Program of Electrical, Systems and Information Engineering, however, the program targets students who belong to Cluster 2 and, therefore, the person responsible for executing the program is the Cluster 2 leader. Planning, implementing, evaluation, and handling are discussed mainly in the Cluster 2 Education Program committee and in the Cluster 2 committee (held, in principle, on the first Wednesday of every month) in an appropriate manner. Depending on the situation or content, a working group is established at the instruction of the Cluster leader to focus in the issues at hand.

When there is a need to consider the response on a program basis, research laboratory groups responsible for the applicable program take the necessary measures. In that case, the responsible person is appointed by the Cluster leader.

(2) Program assessment

Whether or not each class subject is properly allocated in light of the goals of the program, and whether course content is appropriate

Whether or not students taking the course have one average achieved the goal or above

Whether or not the system runs in proper cycles that enable the program to continually improve in an upward spiral

Conducting self-assessment for each subject based on the results of class evaluations carried out by students who have taken the course, and also based on grade calculation results

Regarding the upward spiral of the program, obtaining the questionnaire from graduates in suitable cycles and also collecting the needs from business corporations

Position on giving feedback to students and how it is approached

For individual courses, the teacher in charge gives comments on course evaluation results and academic achievement results.

For re-examining the program structure, the reasons for and the purposes of re-examination are given on the website.

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Required subject
○ Compulsory elective subje
Free elective subject

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Cluster 2 Specialized Subjects

(Program of Electrical,Systems and Information Engineering)

◎ Required subject
○ Compulsory elective subject
△ Free elective subject

Class Subjects	Credits	Type of course registration	Class Hours/Week																Note
			1st grade				2nd grade				3rd grade				4th grade				
			Spring		Fall		Spring		Fall		Spring		Fall		Spring		Fall		
			1T	2T	3T	4T	1T	2T	3T	4T	1T	2T	3T	4T	1T	2T	3T	4T	
Electromagnetism I	2	○					4												
Electromagnetism II	2	△							4										
Exercise of Electromagnetism I	1	△					4												
Exercise of Electromagnetism II	1	△							2										
High-voltage Engineering	1	△											2						
Introduction to Semiconductor Devices and Circuits*	2	△						(4)				4							
Electric and Electronic Measurements	2	△									4								
Electric Transient Phenomena	2	○							4										
Circuit Theory II	2	◎						4											
Electronic Circuits	2	◎								4									
Exercise of Electric Circuit	1	◎						2											
Electric Energy Generation and Conversion	2	○								4									
Fundamentals of Power Systems	2	○									4								
Power System Engineering	2	○												4					
Power Electronics and Motor Control Application	2	△												4					
Nuclear Engineering	2	△												4					
Regulations for Electrical Facilities	1	△															2		
Control Systems Engineering I	2	◎						4											
Control Systems Engineering II	2	○								4									
Signal Processing Engineering	2	◎										4							
Exercises in Measurement and Control Engineering	1	◎							2										
Bioelectrical Engineering	2	○										4							
Robotics	2	○											4						
Communication Engineering	2	△										4							
Mathematical Programming	2	◎					4												
Fundamentals of Probability Theory	2	◎								4									(School of Informatics and Data Science)
Simulation Engineering	2	○							4										
Exercises in Systems Planning and Control	1	◎										2							
Decision Making	2	○												4					
Production Control	2	○											4						
Social System Engineering	2	△									4								
Logic System Design	2	△					4												(School of Informatics and Data Science)
Software Engineering I *	2	△						(4)				4							(School of Informatics and Data Science)
Introduction to Artificial Intelligence	2	△					4												(School of Informatics and Data Science)
Computer Network	2	△												4					(School of Informatics and Data Science)
Algorithms and Data Structures*	2	△							(4)				4						(School of Informatics and Data Science)
Human Computer Interaction	2	△											4						(School of Informatics and Data Science)
Theory of Computing	2	△									4								(School of Informatics and Data Science)
Stochastic Modeling*	2	△								(4)				4					(School of Informatics and Data Science)
Graduation Thesis	5	◎																	

*)Students can register 2nd grade or 3rd grade.

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