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Appended Form 1

Specifications for Major Program

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

Program name (Japanese)	電気システム情報プログラム
(English)	Program of Electrical, Systems and Information Engineering

1. Academic degree to be acquired :

2. Overview

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 (electricity, electronics, systems, and information) 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

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

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)
- Technical Radio Operator (partially exempted from taking examination subject)
- Chief Telecommunications Engineer (partially exempted from taking examination subject)

- On-the-Ground Services I - Category Special Radio Operator
- Maritime Category II Special Radio Operator, and Maritime Category III Special Radio Operator
- Engineer for Architectural Equipment (Qualification of candidacy for an exam is given to those who gain two or

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 abstract concept of electricity, systems, and information. By providing everything, from the basic concepts to cutting-

- The mathematical methodology required by experts in the field of electrical, systems and information (Goal B).

the period from the third or fourth term of the first year through the second year.

- The concepts, knowledge, and methodology that form the foundation of the field of electrical, systems and information (Goal B). This is obtained through mastery of specialized subjects to be offered during the period from the third or fourth term of the first year through the third year.

- The ability to apply basic concepts, knowledge, and methodology in the field of electrical, systems and information to concrete, professional issues (Goal B). This is obtained through mastery of specialized subjects to be offered during the period from the third or fourth term of the first year through the third year.

- The ability to resolve problems and challenges by using experiments to solve practical problems, by using methods of numerical calculation, and by gathering relevant data (Goal D). This is obtained through mastery of basic

the period from the first or second term of the second year through the third year.

- adjustments and resolve problems and challenges by using basic and specialized knowledge and methods (Goal

○Comprehensive Abilities

- Creative and logical thinking to analyze practical problems and challenges, and to reach rational solutions that meet the requirements of society, as well as the engineering development abilities to physically realize such solutions (Goal C, D)

- The ability to organize research results and write logically, including regarding the significance and validity of the obtained outcomes, and to present these research outcomes and discuss them verbally and in an easy-to-

fourth year.

- The teamwork, leadership, and communication abilities needed to work in a group (Goal E) These are obtained during the period from the second year through the third year.

- The ability to take an approach to solving various problems after understanding that such problems that exist in humankind, society, and among individuals can be interpreted in various ways depending on social conditions, cultures, etc. This

- The ability to read, write, converse, and retrieve information in the English language, necessary for conducting research (Goal E) This is ob

5. Program Timing/Acceptance Conditions

At the beginning of the second year, students are assigned to this program based on consideration of their request and academic results. In order to be assigned to this program, 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), Land-Based Services Category I Special Radio Operator, Maritime Category II Special Radio Operator, and Maritime Category III Special Radio Operator. Besides that, by mastering the predetermined class subjects, students are exempted from the examination subjects of the national exams for electrical chief engineers, chief telecommunications engineers and technical radio operators.

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.

8. Academic Achievements

At the end of each semester, the evaluation criteria are applied to each evaluation item of academic achievement to

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.

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 coSQ EMC /Sp Q EMC /Ption of i84()-10(are m)ility to c e a 3(c)-to.1D18'

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.

Cluster 2 Basic Specialized Subjects

- ◎ Required subject
 ○ Compulsory elective subject
 △ Free elective subject

Class Subjects	Credits	Type of course registration		Class Hours/Week																Note
		Electrical, Systems and Information Engineering	Electronic Devices and Systems	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	
Applied Mathematics I	2	◎	◎			4														
Applied Mathematics II	2	○	◎				4													
Applied Mathematics III	2	◎	◎					4												
Discrete Mathematics I	2	○						4												(School of Informatics and Data Science)
Synthesis of Applied Mathematics	2	○	○						4											
Engineering Mathematics A	2	△								4										
Engineering Mathematics C	2	△	○							4										
Probability and Statistics	2	◎	△					4												
Technical English	1	◎	◎										4							
Introduction to Energy and Information Systems	2	◎	◎				4													
Electric Circuit Theory I	2	◎	◎			4														
Programming I	2	◎	◎						4											
Programming II	2	◎	○							4										
Programming III	2	△									4									
Basic Experiments in Electrical Engineering I	2	◎	◎					10	10											take classes at one of the terms
Basic Experiments in Electrical Engineering II	2	◎	◎							10	10									take classes at one of the terms
Experiments in Electrical Engineering Electronics and System Engineering I	2	◎	◎									10	10							take classes at one of the terms
Experiments in Electrical Engineering Electronics and System Engineering II	2	◎	◎											10	10					take classes at one of the terms

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					
Electronic Appliances	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								
Regulations Concerning Telecommunication	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										
Digital Circuit Design	2	△						(4)				4								(School of Informatics and Data Science)
Software Engineering	2	△						(4)				4								(School of Informatics and Data Science)
Artificial Intelligence and Machine Learning	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.



