For entrants in AY 2026

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：Bachelor's degree in engineering

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 (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 Semiconductor 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 （Policy for Preparing & Implementing Curriculum ）

The Program of Electrical, Systems and Information Engineering prepares and implements a curriculum that provides the following knowledge and abilities so that students are able to achieve the goals of the program.

In the curriculum, teaching and learning will be implemented by utilizing active learning and online classes, depending on the delivery methods of the program, such as lectures and seminars.

In addition to strict grading using the standards clearly outlined in the syllabus, learning outcomes are evaluated based on the degree to which the goals set by the educational program are achieved.

○Knowledge/Understandings

・ Cultivation of the understanding of society-technology relations and the ethical outlook necessary for an engineer (Goal A). This is obtained through mastery of liberal arts education subjects such as "Introduction to University Education", and "Courses in Arts and Humanities/Social Sciences", and basic specialized subjects such as "Introduction to Energy and Information Systems" to be offered in the first year.

・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.

・Basic knowledge of physical theory and experimental methods required by scientists and engineers (Goal B). This is obtained through mastery of fundamental subjects such as "General Mechanics", "Experimental Methods and Laboratory Work in Physics" to be offered in the first year.

・ General understanding and acquisition of knowledge about technologies in the field of electronic systems, and acquisition of the basic knowledge common to this field (Goal B). This is obtained through mastery of "Introduction to Energy and Information Systems" and "Electric Circuit Theory I" to be offered in the first year.

○Abilities/Skills

・ The mathematical methodology required by experts in the field of electrical, systems and information (Goal B). This is obtained through mastery of basic specialized subjects such as “Applied Mathematics” to be offered during 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 specialized subjects such as “Basic Experiments in Electrical Engineering” and “Programming” to be offered during the period from the first or second term of the second year through the third year.

・The ability to make action plans on one’s own initiative in relation to practical issues and challenges, make adjustments and resolve problems and challenges by using basic and specialized knowledge and methods (Goal C, D). This is obtained through mastery of “Graduation Thesis” to be offered in the fourth year.

○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-understand manner (Goal E). This is obtained through mastery of “Graduation Thesis” to be offered in the fourth year.

・ The teamwork, leadership, and communication abilities needed to work in a group (Goal E). These are obtained through mastery of Basic specialized subjects such as “Basic Experiments in Electrical Engineering” to be offered 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 is obtained through mastery of liberal arts education subjects such as “Basic language I” and “Area Courses”.

・The ability to read, write, converse, and retrieve information in the English language, necessary for conducting research (Goal E). This is obtained through mastery of “Technical English” to be offered in the third year and “Graduation Thesis“ to be offered in the fourth year.

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). 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 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.

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

Evaluation of academic achievement	Converted values
S(Excellent: 90 points or higher)	4
A(Superior:80-89 points)	3
B(Good: 70-79 points)	2
C(Fair: 60-69 points)	1

* 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.)

○ Positioning

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

○ When and how it is assigned

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

○ Criteria for 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

○ How it is assessed

・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.

Cluster 2 (Electrical, Electronic and Systems Engineering)

◎ Required subject (period of registration specified)

○ Compulsory elective subject (any of these subjects shall be registered)

△ Free elective subject (any of these subjects shall be registered)

Subject Type				Required No. of credits	Class subjects, etc.	No. of credits	Type of course registration	Year in which the subject is taken(*The lower figure means semester)(Note 1)															
								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
Liberal Arts Education Subjects	Peace Science Foundation	Peace science curse		2		2	Compulsory elective		○														
	Basic Courses in University Education	Introduction to University Education		2	Introduction to University Education	2	Required	◎															
		Introductory Seminar for First-Year		2	Introductory Seminar for First-Year Students	2	Required	◎															
		Advanced Seminar		0		1	Free elective			△	△												
	Common Subjects	Area Courses		4	Courses in Arts and Humanities/Social Sciences	2	Compulsory elective	○		○													
				4	Courses in Natural Sciences	2			○		○												
		Foreign Languages	English (Note2・3) Basic English Usage	2	Basic English UsageI	1	Required	◎	◎														
					Basic English UsageII	1				◎	◎												
			English (Note2・3) Communication I	2	CommunicationIA	1	Required	◎	◎														
					Communication IB	1		◎	◎														
			English (Note2・3) Communication II	2	Communication IIA	1	Required			◎	◎												
					Communication IIB	1				◎	◎												
			Initial Foreign Languages (Select one language from German, French, Spanish, Russian, Chinese, Korean and Arabic)	2	1 subjects from Basic language I	1	Compulsory elective	○															
					1 subjects from Basic language II	1			○														
		Information and Data Science Courses		2	Introduction to Information and Data Sciencies	2	Required		◎														
		Health and Sports Cou		2		1or2	Compulsory elective	○	○	○	○												
	Basic Subjects			16	CalculusI	2	Required		◎														
					CalculusII	2					◎												
					Linear AlgebraI	2		◎															
					Linear AlgebraII	2				◎													
					Seminar in Basic Mathematics I	1			◎														
					Seminar in Basic Mathematics II	1					◎												
					General Mechanics I	2		◎															
					General Mechanics II	2				◎													
					Experimental Methods and Laboratory Work in Physics I (Note 4)	1				◎													
					Experimental Methods and Laboratory Work in Physics II (Note 4)	1					◎												
	Free elective subjects			6	From all Subject Type (Note 5)		Free elective	△	△	△	△												
	No. of credits required for graduation			48																			

Note 1: When students fail to acquire the credit during the term or semester marked with ◎, ○, △ in the boxes for the year in which the course is taken, they can take the course in subsequent terms or semesters. Depending on class subject, courses may be offered in semesters or terms different from those scheduled. Please be sure to check the time schedule for Liberal Arts Education subjects

Note 2: The credit obtained by mastery of self-directed study of "Online Seminar in English A・B" cannot be counted towards the credit necessary for graduation. The credit obtained by Overseas Language Training can be recognized as Communication Ⅰor Ⅱif application is made in advance. For more details, please refer to the article on English in Liberal Arts Education in the student handbook.

Note 3: We have a recognition of credit system for foreign language proficiency tests. For more details, please refer to the article on Foreign Language in Liberal Arts Education in the student handbook.

Note 4: Students must take both「Experimental Methods and Laboratory WorkⅠ(1credit)」and「Experimental Methods and Laboratory WorkⅡ(1credit)」.

Note 5: You should take subjects from the Area courses in Natural Sciences and Basic subjects.

Cluster 2 Basic Specialized Subjects

◎ Required subject
○Compulsory elective subje
△Free elective subject

Class Subjects	Credits	Type of course registration		Class Hours/Week																Note
		Electrical,Systems and Information Engineering	Semiconductor 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	◎	◎					5	5											
Basic Experiments in Electrical Engineering II	2	◎	◎							5	5									
Experiments in Electrical Engineering Electronics and System Engineering I	2		◎									5	5							
Experiments in Electrical Engineering Electronics and System Engineering II	2	◎										5	5							

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	○					2	2											
Electromagnetism II	2	△							2	2									
Exercise of Electromagnetism I	1	△					2	2											
Exercise of Electromagnetism II	1	△							1	1									
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 IIA	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												
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 Ⅰ	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.

Academic Achievements in Electrical, Systems and Information Engineering Program

The Relationship between Evaluation Items and Evaluation Criteria

Academic Achievements			Evaluation Criteria		
Evaluation Items			Excellent	Very Good	Good
Knowledge/Understandings	(1)	The ethics and understanding about the relations between society and technology considered basically necessary for engineers.	Sufficiently understand relations between society and technology, and be able to behave with a sufficient sense of ethics.	Understand relations between society and technology at the standard level, and be able to behave with a standard sense of ethics.	Marginally understand relations between society and technology, and be able to behave with a minimum sense of ethics.
	(2)	Basic knowledge of mathematics such as calculus and linear algebra, which is required for scientists/engineers.	Acquire and be able to utilize sufficient basic knowledge of mathematics such as calculus and linear algebra.	Acquire and be able to utilize standard basic knowledge of mathematics such as calculus and linear algebra.	Acquire and be able to utilize minimum basic knowledge of mathematics such as calculus and linear algebra.
	(3)	Basic knowledge of theories and experimental methods of physics, which is required for scientists/engineers.	Acquire and be able to utilize sufficient basic knowledge of theories and experimental methods of physics.	Acquire and be able to utilize standard basic knowledge of theories and experimental methods of physics.	Acquire and be able to utilize minimum basic knowledge of theories and experimental methods of physics.
	(4)	Comprehensive understanding and knowledge of technologies in electrical, systems, and information engineering. Also, basic knowledge which is common in these fields.	Sufficiently acquire and be able to utilize general common and basic knowledge of electrical, systems, and information engineering.	Sufficiently acquire and be able to utilize general common and basic knowledge of electrical, systems, and information engineering.	Marginally acquire and be able to utilize general, common and basic knowledge of electrical, systems, and information engineering.
Abilities/Skills	(1)	Mathematical methods required for professionals in electrical, systems, and information engineering.	Sufficiently acquire and be able to utilize mathematical methods which are required for professionals in electrical, systems, and information engineering.	Acquire and be able to utilize mathematical methods which are required for professionals in electrical, systems, and information engineering, at the standard level.	Marginally acquire and be able to utilize mathematical methods which are required for professionals in electrical,systems, and information engineering.
	(2)	Concepts, knowledge and methods which are the basis for studies related to electrical, systems, and information engineering.	Sufficiently acquire and be able to utilize concepts, knowledge and methods which are the basis for studies related to electrical, systems, and information engineering.	Aquire and be able to utilize concepts, knowledge and methods of electrical, systems, and information engineering, at the standard level.	Marginally acquire and be able to utilize concepts, knowledge and methods which are the basis for studies related to electrical, systems, and information engineering.
	(3)	Ability to apply basic concepts, knowledge, and methods of electrical, systems, and information engineering to concrete/technical problems.	Acquire and be able to utilize sufficient abilities to apply basic concepts, knowledge, and methods of electrical, systems, and information engineering to concrete/technical problems.	Acquire and be able to utilize standard abilities to apply basic concepts, knowledge, and methods of electrical, systems, and information engineering to concrete/technical problems.	Acquire and be able to utilize marginal abilities to apply basic concepts, knowledge, and methods of electrical, systems, and information engineering to concrete/technical problems.
	(4)	Ability to solve practical issues and problems by conducting experiments, using numerical computation methods, and collecting relevant materials.	Acquire and be able to utilize sufficient abilities to solve practical issues and problems by conducting experiments, using mathematical methods, and collecting relevant materials.	Acquire and be able to utilize standard abilities to solve practical issues and problems by conducting experiments, using mathematical methods, and collecting relevant materials.	Acquire and be able to utilize marginal abilities to solve practical issues and problems by conducting experiments, using mathematical methods, and collecting relevant materials.
	(5)	Ability to solve pracitical issues and problems by voluntarily making a plan, revising it, and utilizing basic and technical knowledge and methods.	Acquire and be able to utilize sufficient abilities to solve pracitical issues and problems by voluntarily making a plan, revising it, and utilizing basic and technical knowledge and methods.	Acquire and be able to utilize standard abilities to solve pracitical issues and problems by voluntarily making a plan, revising it, and utilizing basic and technical knowledge and methods.	Acquire and be able to utilize marginal abilities to solve pracitical issues and problems by voluntarily making a plan, revising it, and utilizing basic and technical knowledge and methods.
Comprehensive Abilities	(1)	Creative thinking ability and logical thinking skills to analyze practical problems and tasks, and to lead to rational solutions satisfying social needs, as well as technical development skills to physically realize the solutions.	Sufficiently aqcuire and be able to utilize logical thinking skills to lead to rational solutions satisfying social needs and technical development skills to phisically realize the solutions.	Aqcuire and be able to utilize logical thinking skills to lead to rational solutions satisfying social needs and technical development skills to phisically realize the solutions, at the standard level.	Marginally aqcuire and be able to utilize logical thinking skills to lead to rational solutions satisfying social needs and technical development skills to phisically realize the solutions.
	(2)	Skills to organize research results and to describe them logically including the significance and the effectiveness of the obtained outcomes as well as to make easy-to-understand oral presentations and discussions.	Acquire and be able to utilize sufficient skills to organize research results and to describe them logically including the significance and the effectiveness of the obtained outcomes as well as to make easy-to-understand oral presentations and discussions.	Acquire and be able to utilize standard skills to organize research results and to describe them logically including the significance and the effectiveness of the obtained outcomes as well as to make easy-to-understand oral presentations and discussions.	Acquire and be able to utilize marginal skills to organize research results and to describe them logically including the significance and the effectiveness of the obtained outcomes as well as to make easy-to-understand oral presentations and discussions.
	(3)	Teamwork, leadership and communication skills in group works.	Sufficiently acquire and be able to utilize the teamwork, leadership and communication skills for presentations and discussions through solving issues in group works.	Acquire and be able to utilize the teamwork, leadership and communication skills for presentations and discussions through solving issues in group works, at the standard level.	Marginally acquire and be able to utilize the teamwork, leadership and communication skills for presentations and discussions through solving issues in group works.
	(4)	Ability to understand that various problems, which humanity, society, and individuals are facing, can be interpreted variously depending on social status, culture and so on, as well as to deal with those problems to solve.	Sufficiently acquire and utilize skills to fully understand that various problems, which humanity, society, and individuals are facing, can be interpreted variously depending on social status, culture and so on, as well as to deal with those problems to solve.	Acquire and utilize skills at the standard level to understand that various problems, which humanity, society, and individuals are facing, can be interpreted variously depending on social status, culture and so on, as well as to deal with those problems to solve,	Marginally acquire and utilize skills to minimally understand that various problems, which humanity, society, and individuals are facing, can be interpreted variously depending on social status, culture and so on, as well as to deal with those problems to solve.
	(5)	Ability of English conversation, reading and writing skills necessary for research accomplishment.	Sufficiently acquire and be able to utilize the ability of English conversation, reading and writing skills necessary for engineers.	Acquire and be able to utilize the ability of English conversation, reading and writing skills necessary for engineers, at the standard level.	Marginally acquire and be able to utilize the ability of English conversation, reading and writing skills necessary for engineers.

Position of Liberal Arts Education in Major Program

Liberal Arts Education in this program assumes the role of establishing the academic foundation on which the specialized education for Cluster 2 in the School of Engineering is built. It fosters a willing, self-reliant attitude and cultivates scientific thinking based on data gathering ability, analytical ability, and critical thinking ability. It establishes an outlook that makes it possible to provide insight on the inner nature of things and their background from a broad perspective, and enhances linguistic ability to a level appropriate for living as a world citizen, and also strengthens interest in peace and the ability integrates a broad range of knowledge into a body of knowledge that will be truly useful in solving problems. It cultivates the ability to explore and promote cross-disciplinary and comprehensive research that goes beyond the established frameworks.

Relationships between the evaluation items and class subjects

Subject type	Class subjects	credits	Type of course registration	Period	Evaluation items																												Total weighted values of evaluation items in the
					Knowledge/Understanding								Abilities/Skills										Comprehensive Abilities											
					(1)		(2)		(3)		(4)		(1)		(2)		(3)		(4)		(5)		(1)		(2)		(3)		(4)		(5)			
					Weighted values of evaluation items in the	Weighted values of evaluation items	Weighted values of evaluation items in the	Weighted values of evaluation items	Weighted values of evaluation items in the	Weighted values of evaluation items	Weighted values of evaluation items in the	Weighted values of evaluation items	Weighted values of evaluation items in the	Weighted values of evaluation items	Weighted values of evaluation items in the	Weighted values of evaluation items	Weighted values of evaluation items in the	Weighted values of evaluation items	Weighted values of evaluation items in the	Weighted values of evaluation items	Weighted values of evaluation items in the	Weighted values of evaluation items	Weighted values of evaluation items in the	Weighted values of evaluation items	Weighted values of evaluation items in the	Weighted values of evaluation items	Weighted values of evaluation items in the	Weighted values of evaluation items	Weighted values of evaluation items in the	Weighted values of evaluation items		
Liberal Arts Education	Introduction to University Education	2	Required	1semsester-1T																			50	1	50	1							100
Liberal Arts Education	Introductory Seminar for First-Year Students	2	Required	1semsester-1T																			50	1	50	1							100
Liberal Arts Education	Peace Science Courses	2	Elective	1semsester-2T																									100	1			100
Liberal Arts Education	Area Courses(Courses in Arts and Humanities/Social Sc)	4	Elective	1semsester-1T, 2semsester-3T																									100	1			100
Liberal Arts Education	Area Courses(Courses in Natural Sciences)	4	Elective	1semsester-2T, 2semsester-4T																									100	1			100
Liberal Arts Education	Basic English UsageI	1	Required	1semester(Intensive course)																											100	1	100
Liberal Arts Education	Basic English UsageII	1	Required	2semester(Intensive course)																											100	1	100
Liberal Arts Education	CommunicationⅠA	1	Required	1semsester																											100	1	100
Liberal Arts Education	Communication ⅠB	1	Required	1semsester																											100	1	100
Liberal Arts Education	Communication ⅡA	1	Required	2semsester																											100	1	100
Liberal Arts Education	Communication ⅡB	1	Required	2semsester																											100	1	100
Liberal Arts Education	Basic language I	1	Elective	1semsester-1T																									100	1			100
Liberal Arts Education	Basic language II	1	Elective	1semsester-2T																									100	1			100
Liberal Arts Education	Introduction to Information and Data Sciences	2	Required	1semsester-2T	100	1																											100
Liberal Arts Education	Health and Sports Courses	2	Elective	1・2semsester																									100	1			100
Liberal Arts Education	CalculusI	2	Required	1semsester-2T			100	1																									100
Liberal Arts Education	CalculusII	2	Required	2semsester-4T			100	1																									100
Liberal Arts Education	Linear AlgebraI	2	Required	1semsester-1T			100	1																									100
Liberal Arts Education	Linear AlgebraII	2	Required	2semsester-3T			100	1																									100
Liberal Arts Education	Seminar in Basic Mathematics I	1	Required	1semsester-2T			100	1																									100
Liberal Arts Education	Seminar in Basic Mathematics II	1	Required	2semsester-4T			100	1																									100
Liberal Arts Education	General Mechanics I	2	Required	1semsester-1T					100	1																							100
Liberal Arts Education	General Mechanics II	2	Required	2semsester-3T					100	1																							100
Liberal Arts Education	Experimental Methods and Laboratory Work in Physics I・Ⅱ	2	Required	2semsester					100	1																							100
Specialized Education	Introduction to Energy and Information Systems	2	Required	2semsester-4T	50	1					50	1																					100
Specialized Education	Applied Mathematics I	2	Required	2semsester-3T									100	1																			100
Specialized Education	Applied Mathematics II	2	Elective	3semsester-1T									100	1																			100
Specialized Education	Applied Mathematics III	2	Required	3semsester-2T									100	1																			100
Specialized Education	Discrete Mathematics I	2	Elective	3semsester-2T									100	1																			100
Specialized Education	Synthesis of Applied Mathematics	2	Elective	4semsester-3T									100	1																			100
Specialized Education	Engineering Mathematics A	2	Elective	5semsester-1T									100	1																			100
Specialized Education	Engineering Mathematics C	2	Elective	4semsester-4T									100	1																			100
Specialized Education	Probability and Statistics	2	Required	3semsester-1T									100	1																			100
Specialized Education	Technical English	1	Required	6semsester-3T																											100	1	100
Specialized Education	Electric Circuit Theory I	2	Required	2semsester-3T							100	1																					100
Specialized Education	Programming I	2	Required	3semsester-2T											50	1			50	1													100
Specialized Education	Programming II	2	Required	4semsester-3T											50	1			50	1													100
Specialized Education	Programming III	2	Elective	5semsester-1T											50	1			50	1													100
Specialized Education	Basic Experiments in Electrical Engineering I	2	Required	3semsester															50	1							50	1					100
Specialized Education	Basic Experiments in Electrical Engineering II	2	Required	4semsester															50	1							50	1					100
Specialized Education	Experiments in Electrical Engineering Electronics and System Engineering II	2	Required	5semsester															50	1							50	1					100
Specialized Education	Electromagnetism I	2	Compulsory elective	3semsester-1T・2T											100	1																	100
Specialized Education	Electromagnetism II	2	Free elective	4semsester-3T・4T											50	1	50	1															100
Specialized Education	Exercise of Electromagnetism I	1	Free elective	3semsester-1T・2T											50	1	50	1															100
Specialized Education	Exercise of Electromagnetism II	1	Free elective	4semsester-3T・4T											50	1	50	1															100
Specialized Education	High-voltage Engineering	1	Free elective	6semsester-3T													100	1															100
Specialized Education	Introduction to Semiconductor Devices and Circuits	2	Free elective	(3semsester-2T), 5semsester-2T											100	1																	100
Specialized Education	Electric and Electronic Measurements	2	Free elective	4semsester-3T													100	1															100
Specialized Education	Electric Transient Phenomena	2	Compulsory elective	4semsester-3T											50	1	50	1															100
Specialized Education	Circuit Theory IIA	2	Required	3semsester-2T											50	1	50	1															100
Specialized Education	Electronic Circuits	2	Required	4semsester-4T											50	1	50	1															100
Specialized Education	Exercise of Electric Circuit	1	Required	3semsester-2T													100	1															100
Specialized Education	Electric Energy Generation and Conversion	2	Required	4semsester-4T													100	1															100
Specialized Education	Fundamentals of Power Systems	2	Compulsory elective	5semsester-1T													100	1															100
Specialized Education	Power System Engineering	2	Compulsory elective	6semsester-4T													100	1															100
Specialized Education	Power Electronics and Motor Control Application	2	Free elective	6semsester-4T													100	1															100
Specialized Education	Nuclear Engineering	2	Free elective	6semsester-4T													100	1															100
Specialized Education	Regulations for Electrical Facilities	1	Free elective	8semsester-3T													100	1															100
Specialized Education	Control Systems Engineering I	2	Required	3semsester-2T											50	1	50	1															100
Specialized Education	Control Systems Engineering II	2	Compulsory elective	4semsester-4T											50	1	50	1															100
Specialized Education	Signal Processing Engineering	2	Required	5semsester-2T											50	1	50	1															100
Specialized Education	Exercises in Measurement and Control Engineering	1	Required	4semsester-3T													100	1															100
Specialized Education	Bioelectrical Engineering	2	Compulsory elective	5semsester-2T													100	1															100
Specialized Education	Robotics	2	Compulsory elective	6semsester-3T											100	1																	100
Specialized Education	Communication Engineering	2	Free elective	5semsester-2T													100	1															100
Specialized Education	Mathematical Programming	2	Required	3semsester-1T											50	1	50	1															100
Specialized Education	Simulation Engineering	2	Compulsory elective	4semsester-3T													100	1															100
Specialized Education	Exercises in Systems Planning and Control	1	Required	5semsester-2T													100	1															100
Specialized Education	Decision Making	2	Compulsory elective	6semsester-4T											100	1																	100
Specialized Education	Production Control	2	Compulsory elective	6semsester-3T													100	1															100
Specialized Education	Social System Engineering	2	Free elective	5semsester-1T											100	1																	100
Specialized Education	Logic System Design I	2	Free elective	3semsester-1T											50	1	50	1															100
Specialized Education	Software Engineering I	2	Free elective	(3semsester-2T), 5semsester-2T													100	1															100
Specialized Education	Introduction to Artificial Intelligence	2	Free elective	6semsester-3T													100	1															100
Specialized Education	Computer Network	2	Free elective	6semsester-4T													100	1															100
Specialized Education	Algorithms and Data Structures	2	Free elective	(4semsester-3T), 6semsester-3T											50	1	50	1															100
Specialized Education	Human Computer Interaction	2	Free elective	6semsester-3T													100	1															100
Specialized Education	Theory of Computing	2	Free elective	5semsester-1T											50	1	50	1															100
Specialized Education	Stochastic Modeling	2	Free elective	(4semsester-4T), 6semsester-4T											50	1	50	1															100
Specialized Education	Graduation Thesis	5	Required	7・8semsester																	25	1	25	1	25	1					25	1	100

Curriculum Map of Electrical, Systems and Information Engineering

	Academic Achievement	1st grade		2nd grade		3rd grade		4th grade	
	Evaluation Items	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall
Knowledge/Understanding	(1) The ethics and understanding about the relations between society and technology considered basically necessary for engineers.	(2T)Introduction to Information and Data Sciencies(◎)	(4T)Introduction to Energy and Information Systems(◎)						
	(2) Basic knowledge of mathematics such as calculus and linear algebra, which is required for scientists/engineers.	(2T)CalculusI(◎) (1T)Linear AlgebraI(◎) (2T)Seminar in Basic Mathematics I(◎)	(4T)CalculusII(◎) (3T)Linear AlgebraII(◎) (4T)Seminar in Basic Mathematics II(◎)						
	(3)Basic knowledge of theories and experimental methods of physics, which is required for scientists/engineers.	(1T)General Mechanics I(◎)	(3T)General Mechanics II(◎) Experimental Methods and Laboratory Work in Physics Ⅰ・Ⅱ(◎)						
	(4)Comprehensive understanding and knowledge of technologies in electrical, systems, and information engineering. Also, basic knowledge which is common in these fields.		(3T)Electric Circuit Theory I(◎) (4T)Introduction to Energy and Information Systems(◎)						
Abilities/Skills	(1)Mathematical methods required for professionals in electrical, systems, and information engineering.		(3T)Applied Mathematics I(◎)	(1T)Applied Mathematics II(○) (2T)Applied Mathematics III(◎) (2T)Discrete Mathematics I(○) (1T)Probability and Statistics(◎)	(3T)Synthesis of Applied Mathematics(○) (4T)Engineering Mathematics C(△)	(1T)Engineering Mathematics A(△)			
	(2)Concepts, knowledge and methods which are the basis for studies related to electrical, systems, and information engineering.			(1T) Programming I(◎) Electromagnetism I(○) Exercise of Electromagnetism I(△) (2T)Introduction to Semiconductor Devices and Circuits(△) (2T)Circuit Theory IIA(◎) (2T)Control Systems Engineering I(◎) (1T)Mathematical Programming(◎)	(3T) Programming II(◎) Electromagnetism II(△) Exercise of Electromagnetism II(△) (3T)Electric Transient Phenomena(○) (4T)Electronic Circuits(◎) (4T)Control Systems Engineering II(○) ((3T)Digital Circuit Design(△)) ((3T)Algorithms and Data Structures(△)) ((4T)Stochastic Modeling (△))	(1T) Programming III(△) (2T)Signal Processing Engineering(◎) (1T)Social System Engineering(△) (2T)Introduction to Semiconductor Devices and Circuits(△) (1T)Theory of Computing(△)	(3T)Robotics(○) (4T)Decision Making(○) (3T)Digital Circuit Design(△) (3T)Algorithms and Data Structures(△) (4T)Stochastic Modeling(△)		
	(3)Ability to apply basic concepts, knowledge, and methods of electrical, systems, and information engineering to concrete/technical problems.			Exercise of Electromagnetism I(△) (2T)Circuit Theory IIA(◎) (2T)Exercise of Electric Circuit(◎) (2T)Control Systems Engineering I(◎) (1T)Mathematical Programming(◎) ((2T)Software Engineering(△)) (1T)Introduction to Artificial Intelligence (△) (1T)Artificial Intelligence and Machine Learning(△) (1T)Logic System Design(△)	Electromagnetism II(△) Exercise of Electromagnetism II(△) (3T)Electric Transient Phenomena(○) (4T)Electric Energy Generation and Conversion(◎) (4T)Electronic Circuits(◎) (4T)Control Systems Engineering II(○) (3T)Exercises in Measurement and Control Engineering(◎) (3T)Simulation Engineering(○) ((3T)Digital Circuit Design(△)) ((3T)Algorithms and Data Structures (△)) ((4T)Stochastic Modeling(△)) (3T)Electric and Electronic Measurements(△)	(1T)Fundamentals of Power Systems(○) (2T)Signal Processing Engineering(◎) (2T)Bioelectrical Engineering(○) (2T)Exercises in Systems Planning and Control(◎) (1T)Software Engineering(△) (1T)Theory of Computing(△) Communication Engineering(△)	(3T)High-voltage Engineering(△) (4T)Power System Engineering(○) (4T)Nuclear Engineering(△) (3T)Production Control(○) (3T)Algorithms and Data Structures(△) (4T)Computer Network(△) (4T)Stochastic Modeling(△) (3T)Human Computer Interaction(△)		(3T)Regulations for Electrical Facilities(△)
	(4)Ability to solve practical issues and problems by conducting experiments, using numerical computation methods, and collecting			Basic Experiments in Electrical Engineering I(◎) (2T) Programming I(◎)	Basic Experiments in Electrical Engineering II(◎) (3T) Programming II(◎)	Experiments in Electrical Engineering Electronics and System Engineering Ⅰ・Ⅱ (1T) Programming III(△)			
	(5)Ability to solve practical issues and problems by voluntarily making a plan, revising it, and utilizing basic and technical knowledge and							Graduation Thesis(◎)	Graduation Thesis(◎)
Comprehensive Abilities	(1)Creative thinking ability and logical thinking skills to analyze practical problems and tasks, and to lead to rational solutions satisfying social needs, as well as technical development skills to physically realize the solutions.	Introductory Seminar for First-Year Students(◎) (1T)Introduction to University Education(◎)						Graduation Thesis(◎)	Graduation Thesis(◎)
	(2)Skills to organize research results and to describe them logically including the significance and the effectiveness of the obtained outcomes as well as to make easy-to-understand oral presentations and discussions.	Introductory Seminar for First-Year Students(◎) (1T)Introduction to University Education(◎)						Graduation Thesis(◎)	Graduation Thesis(◎)
	(3)Teamwork, leadership and communication skills in group works.			Basic Experiments in Electrical Engineering I(◎)	Basic Experiments in Electrical Engineering II(◎)	Experiments in Electrical Engineering Electronics and System Engineering Ⅰ・Ⅱ			
	(4)Ability to understand that various problems, which humanity, society, and individuals are facing, can be interpreted variously depending on social status, culture and so on, as well as to deal with those problems to solve	(2T)Peace Science Courses(○) (1T)Area Courses(Courses in Arts and Humanities/Social Sci)(○) (2T)Area Courses(Courses in Natural Sciences)(○) Health and Sports Courses(○) Basic language I(○)	(3T)Area Courses(Courses in Arts and Humanities/Social Sci)(○) (4T)Area Courses(Courses in Natural Sciences)(○) Health and Sports Courses(○)						
	(5)Ability of English conversation, reading and writing skills necessary for research accomplishment.	Basic language II(○) Basic English UsageI(◎) CommunicationIA(◎) Communication IB(◎)	Basic English UsageII(◎) Communication IIA(◎) Communication IIB(◎)				(3T)Technical English(◎)	Graduation Thesis(◎)	Graduation Thesis(◎)
			Liberal Arts Education	Basic Specialized Subjects	Specialized Subjects	Graduation Thesis	(◎) Required subject	(○) Compulsory elective subject	(△) Free elective subject