

For entrants in AY 2021

Appended Form 1

Specifications for Major Program

Name of School (Program)	School of Engineering, Cluster 4 (Social and Environmental Engineering)
Program name (Japanese)	環境社会工学科
(English)	Program of Civil and Environmental Engineering
1. Academic degree to be Acquired>8Bachelor's degree in Engineering	
<p>2. Overview</p> <p>(1) Overview of "English-based Bachelor's Degree Program"</p> <p>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.</p> <p>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.</p> <p>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).</p> <p>(2) Program overview of "Program of Civil and Environmental Engineering".</p> <p>In this program, students learn the engineering theory needed to plan, design, construct, and maintain social infrastructure facilities that create rich communities and social environments, while attempting to harmonize and coexists with natural environments. Students also learn about a wide range of technology for environmental preservation on a global basis, considering that there is a strong demand for technologies that can create advanced, circulatory society that makes effective use of limited resources. Therefore, this program produces professionals and future engineers or researchers who take the initiative in addressing various technical problems, whether global or local, related to coexistence between mankind's activities and the environment. This program produces professionals and future engineers or researchers who set goals on their own initiative, explore solution to problems in a scientific and rational way, and possess the leadership and vitality to achieve their goal in an ethical and harmonious way.</p>	
<p>3. Academic Awards Policy (Policy for awarding degrees and goal of the program)</p> <p>The Program of Civil and Environmental Engineering aims at developing engineers and researchers who are able, at their own discretion, to deal with the various problems faced when engaged in social infrastructure improvement in a comprehensive manner. This program awards a bachelor's degree in engineering to students who have acquired the number of credits necessary to meet the standard of the course and who, through learning the engineering theory needed to plan, design, construct, and maintain social infrastructure facilities, have acquired the liberal arts education and special education designed to achieve the following goals.</p> <p>(A) A wide range of general knowledge and a broad perspective: The ability to view the expanding and increasingly complex societies and natural environments from multiple scientific perspectives of nature, humanities, and society</p> <p>(B) The ability to identify issues: the ability to understand the relationship between nature, humankind, and technology, in both international and regional communities, and ability to identify issues</p> <p>(C) The ability to configure problems: The ability to organize problems logically and construct technical issues</p> <p>(D) The ability to analyze problems: The ability to gather the necessary data, and to abstract, model, and analyze technical issues</p> <p>(E) The ability to evaluate: The ability to propose multiple solutions, predict outcomes, and evaluate relative</p>	

Mechanics and Exercises”, Graduation Thesis

(E>’ Ability to evaluate:

Required abilities: the ability to propose multiple solutions, predict outcomes, and evaluate relative merits
íThe ability to consider the applicability to actual phenomena of theoretically -gained solutions, and their limitations

íThe ability to design multiple alternative solutions, predict outcomes, and compare

íThe ability to explain knowledge gained from research an its applicability, and the limitations and social significance of civil engineering technology

Applicable subjects: specialized subjects such as “Design of Infrastructures”, and “Civil and Environmental Engineering and Engineer’s Ethics”, Graduation Thesis

(F) Communicating abilities

Required abilities: The ability to communicate to others details of proposed solutions, their rationale, their effects, and their feasibility

í The ability to use information processing equipment, and prepare accurate charts, tables, and sentences with a certain level of quality

íThe ability to make one’s ideas understood in a discussion forum and presentation

íThe basic ability to communicate in Japanese and English

Applicable subjects: Liberal arts education subjects such as “Communication Courses”, and “Second Foreign Languages”, specialized basic subjects such as “Experiments in Civil and Environmental Engineering”, specialized subjects such as “Design of Infrastructures”, “Exercise of Technical English”, and “Civil and Environmental Engineering and Engineer’s Ethics”, Graduation Thesis

(G) Implementation and problem-solving abilities:

Required abilities: the ability to implement problem-solving processes in cooperation with other people by making full use of (A) to (F) above. The ability to enhance problem-solving abilities voluntarily and continuously by learning the above processes.

íThe ability to consider one’s role in a group, and proceed with work in a planned manner

íThe ability to evaluate problem -solving processes, and make suggestions for improvement

íThe ability to find knowledge to learn on one’s own initiative in order to answer more complex questions

Applicable subjects: specialized basic subjects such as “Exercise of Surveying”, “Basic Engineering Computer Programming”, and “Experiments in Civil and Environmental Engineering”, mainly specialized subjects such as “Design of Infrastructures”, Graduation Thesis

5. Program Timing and Acceptance Conditions

The English-based Bachelor’s Degree programs begin in the first semester of the first year. Enrollment in Program of Civil and Environmental Engineering is the second year.

Those who are to be assigned to this program are chosen based on their requests and GPA.

6. Qualifications to be Acquired

This program is certified by the Japan Accreditation Board for Engineering Education (JABEE).Those who finish this program are certified as associate professional engineers, and exempt from the first

English.

8>, Academic Achievements

At the end of each semester, evaluation criteria are applied to each evaluation item of academic achievement to clearly demonstrate the attainment level. Students' grade calculations for each subject, from admission to the university until the current semester, is given as one of three levels: "Excellent," "Very Good," and "Good," based on evaluation criteria calculated by adding 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)	4
A (Superior:80-89 points)	3
B (Good: 70-79 points)	2
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) (Purpose, when and how it is assigned, etc.)

This program approves graduation and awards a bachelor's degree in engineering to students who have completed four years' learning according to the standard of the course as described in student handbook, who have met graduation requirements, and who have acquired a total of 46 credits in liberal arts education, a total of 79 credits in specialized education, and an overall total of 125 credits or more. This program also requires the students to write graduation thesis in English.

○ Goal of the Course Students are assigned to one of the various educational courses of Program of Civil

and Environmental Engineering and 2-0808-430-1 The Goal of the subject(s) is 3.00-1.36. The following 2.9 (a 498-03.500.00

staff development, by holding the external advisory committee, and by conducting questionnaires targeted at graduates. The committee also checks and improves the validity of the assessment and improvement system itself.

The examination working groups for each subject check and confirm the class plans and class implementation status, and ask the persons in charge of each subject to prepare class improvement plans. The groups report to the educational program assessment and improvement committee on the achievements of working groups. The external advisory committee examines whether the details of learning and the educational goals and standards can respond to the requirements of society and industry, and gives advice as needed to the educational program assessment and improvement committee. It checks the functioning of the educational assessment and improvement system in this group, and gives advice as needed about its improvement.

Cluster 4 (Civil Engineering and Architecture H

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)

[illegible]

Free elective subjects

From all Subject TypeHNoteHH

Free
elective

Eg Eg Eg Eg Eg Eg Eg Eg

No. of credits required for graduation	46
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Note: When students fail to acquire the credit during the term or semester marked with EHEg 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 to be issued every

Note HHThe credit obtained by mastery of "English-speaking Countries Field Research" or self-directed study of "Online Seminar in English ACB cannot be counted towards the credit necessary for graduation. The credit obtained by Overseas Language Training can be recognized as Communication BorBif application is made in advance. For more details, please refer to the article on English in Liberal Arts Education in the student handbook

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

Note HHStudents must take "Elements of Information Literacy" provided in the first semester. You can take the "Exercise in Information Literacy" provided in the second semester only if you fail to obtain credit for "Information Utilization Basics."

Note: Students must take both Experimental Methods and Laboratory Work.

Note HHStudents can calculate the credits of Basic English Usage.

$$\left. \begin{array}{l} \text{ } \\ \text{ } \end{array} \right\}$$

Request Subjects

												3rd grade								
																Spring		Fall		
				1T	2T	3T	4T	1T	2T	3T	4T	1T	2T	3T	4T	1T	2T	3T	4T	
Applied Mathematics I	2	E,	E,			4														
Applied Mathematics II	2	D	E•					4												
Applied Mathematics III	2	D	E•						4											
Engineering Mathematics A	2	D	E•									4								
Probability and Statistics	2	D	E•					4												
Environmental Theory	2		E•							2	2			2	2					B1
Basic Engineering Computer Programming	2	E,	E,								4	4								B2
Synthesis of Applied Mathematics	2	D	E•							4										
Technical English	1		E,							4										
Creation of Architectural Space	2	D!	E•			4														
Lifestyle and the city	2	D!	E•			4														
Exercise of Mathematics	2	D											4							
Exercise of Technical English	1	E,											4							
Civil and Environmental Engineering and Engineer's Ethics	2	E,													4					
Strength of Materials	2	E,							4											
Exercise of Strength of Materials	1	D							4											
Structural Mechanics	2	E,								4										
Exercise of Structural Mechanics	1	D								4										
Hydraulics	2	E,								4										
Exercise of Hydraulics	1	D								4										
Soil Mechanics	2	E,									4									
Exercise of Soil Mechanics	1	D									4									
Materials Science	2	E,							4											
Concrete Engineering	2	E,									4									
Fluid Mechanics	2	E,						4												
Infrastructure Planning	2	E,									4									
Fundamentals of Environmental Science	2	E,									4									
Land Survey	2	E,						4												
Exercise of Surveying	2	E,						8												
Field Work at Construction Sites	1	Eg												4						
Experiments in Civil and Environmental Engineering	2	E,											8							
Building Material	2		E,							4										
Experiments on Building Materials	1		Dx									3	3							
Introduction of Building Structure	2		Du						4											

Required subjects

Compulsory Elective subjects

Request Subjects

Class Subjects	Credits	Type of course registration Civil and Environmental Engineering Architecture and Building Engineering	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	
Architectural Project and Drawing I	2						6	6											
Architectural Project and Drawing II	2								6	6									
Architectural Structural Mechanics I	4						4	4											
Architectural Structural Mechanics II	4								4	4									
Vibration Theory of Buildings	2														4				
Reinforced concrete structure	2											4							
Geotechnical and Architectural Foundation Engineering	2														4				
Building Administration	2											4							
Field Exercises of Building	1											1	1	1	1				
History of Japanese Architecture	2									4									
Architectural Planning History	2								4										
Town Planning	2										4								
Architectural Environments I	2						4												
Architectural Environments II	2								4										
Exercises in Environmental Science	1											4							
History of contemporary architecture I	2											4							
Field Work in Architecture	1													3	3				
Computer Technology in Architecture	2										4								
Design Concepts of Steel Structures	2								4										
Architecture drawings	2						4												

B1 FAs the course is offered every other year, you should take either of the courses.

B2 FCivil and Environmental Engineering is offered in the second semester of the second year, while Architecture and Building Engineering is offered in the first term of the first semester of the third year.

Required subjects
Compulsory Elective subject
Free elective subject

		1T	2T	3T	4T	1T	2T	3T	4T	1T	2T	3T	4T	1T	2T	3T	4T
Reinforced Concrete Mechanics and Exercises	3 E•									8							
Geotechnical Engineering	2 E•									4							
Bridge and Earthquake-resistance	2 E•											4					
Disaster Prevention Geotechnology	2 E•											4					
Energy Method for Structural Analysis	2 E•												4				
Maintenance Engineering of Structures	2 Eg													4			
Environmental Chemistry of Concrete	2 Eg													4			
Sanitary and environmental engineering and exercise	3 E•									8							
Environmental Hydraulics	2 E•									4							
Transportation System Engineering	2 E•										4						
Coastal Engineering	2 E•												4				
River Engineering	2 E•													4			

Academic Achievements in Civil and Environmental Engineering

The Relationship between Evaluation Items and Evaluation Criteria

Academic Achievements			Evaluation Criteria		
Evaluation Items			Excellent	Very Good	Good
Knowledge and Skills	(1)	General culture and breadth of vision	Being able to see broadened and complicated society and natural environment multilaterally from cross-disciplinary point of views such as nature, culture and society.	Being able to see broadened and complicated society and natural environment multilaterally from cross-disciplinary point of views such as nature, culture and society.	To be able to consider a society and its natural environment from cross-disciplinary perspectives such as nature, the humanities, and community.
	(2)	Ability to structuralize problems	Based on knowledge of mathematics or physics, to be able to structuralize technical problems by organizing the knowledge logically.	To be able to organize problems logically and explain them based on knowledge of mathematics or physics.	To be able to understand the relations between mathematical or physical equations and the problem.
Abilities and Skills	(1)	Ability to analyze problems	By collecting necessary information, to be able to abstract and simulate technical problems and to be able to analyze them.	By collecting necessary information, to be able to abstract and simulate technical problems and to be able to analyze them.	By collecting necessary information, to be able to analyze technical problems.
	(2)	Ability to discover problems	To be able to understand the relationship among nature, human beings and technology in international society or regional society and to be able to find issues in them.	Being able to understand the relationship among nature, human beings and technology in international society and regions.	To be able to understand the relationships among nature, humans, and technology in regional society
Overall Abilities	(3)	Ability for evaluation	To be able to propose more than one solutions and predict the results of them and to be able to evaluate the solutions.	Being able to set a standard her/him self for evaluation and predict the result of proposed solutions	Being able to understand the criteria for evaluation on solutions.
	(4)	Abbility of communication	To be able to present the contents, reasonableness, effect, and feasibility of a proposed solution.	To be able to present the contents and reasonableness of proposed solutions. To other people.	To be able to present the contents of proposed solutions.
Overall Abilities	(5)	Ability to achieve and ability to solve the problem	To be able to handle the problem-solving process with the best use of available knowledge, understanding, ability and skills under the collaboration with others. To be able to improve ability to solve problems and ability to achieve, voluntarily and continuously.	To be able to handle the problem-solving process with the best use of available knowledge, understanding, ability and skills under the collaboration with others.	With the best use of available knowledge, understanding, abilities and skills to be able to handle the problem-solving process.

Placement of the Liberal Arts Education in the Major Program

This program is designed so that abilities that correspond to the above evaluation items may be continuously enhanced by liberal arts education, specialized education, and the graduation thesis. The liberal arts education subject group, along with specialized basic subject group, constitutes the first cycle associated with all items described above, and cultivates the basic abilities associated with learning outcomes. Design subjects, built on specialized subject group, constitute the second cycle and cultivate the applicable abilities associated with the learning outcomes. Graduation thesis, as the third cycle, enhances the abilities associated with the learning outcomes in a comprehensive way.

Relationships between the evaluation items and class subjects

					Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items
Liberal Arts Education	Introductory Seminar for First-Year Students	2	Required	1semester	33	1					33	1			34	1		100
Liberal Arts Education	Peace Science Courses	2	Required	1semester	50	1					50	1						100
Liberal Arts Education	Communication I③	1	Required	1semester	50	1								50	1		100	
Liberal Arts Education	Communication I④	1	Required	1semester	50	1								50	1		100	
Liberal Arts Education	Communication II③	1	Required	1semester	50	1								50	1		100	
Liberal Arts Education	Communication II④	1	Required	1semester	50	1								50	1		100	
Liberal Arts Education	Basic language I	1	Required	1semester	50	1								50	1		100	
Liberal Arts Education	Basic language II	1	Required	1semester	50	1								50	1		100	
Liberal Arts Education	Information Courses	2	Required	1semester										100	1		100	
Liberal Arts Education	Area Courses	2	Elective	1semester	100	1											100	
Liberal Arts Education	Free elective subjects	6	Elective	1semester	100	1											100	
Liberal Arts Education	Health and Sports Courses	2	Required	1semester	100	1											100	
Liberal Arts Education	Calculus I	2	Required	1semester				100	1								100	
Liberal Arts Education	Calculus II	2	Required	1semester				100	1								100	
Liberal Arts Education	Linear Algebra I	2	Required	1semester				100	1								100	
Liberal Arts Education	Linear Algebra II	2	Required	1semester				100	1								100	
Liberal Arts Education	Seminar in Basic Mathematics I	1	Required	1semester				100	1								100	
Liberal Arts Education	Seminar in Basic Mathematics II	1	Required	1semester				100	1								100	
Liberal Arts Education	General Mechanics I	2	Required	1semester				100	1								100	
Liberal Arts Education	General Mechanics II	2	Required	1semester				100	1								100	
Liberal Arts Education	Experimental Methods and Laboratory Work in Physics I	1	Required	1semester				100	1								100	
Specialized Education	Creation of Architectural Space	2	Elective	1semester	50	1				50	1						100	
Specialized Education	Lifestyle and the city	2	Elective	1semester	50	1				50	1						100	
Specialized Education	Applied Mathematics I	2	Required	1semester				100	1								100	
Specialized Education	Applied Mathematics II	2	Elective	1semester				100	1								100	
Specialized Education	Applied Mathematics III	2	Elective	1semester				100	1								100	
Specialized Education	Engineering Mathematics A	2	Elective	1semester				100	1								100	
Specialized Education	Probability and Statistics	2	Elective	1semester				100	1								100	
Specialized Education	Synthesis of Applied Mathematics	2	Elective	1semester				100	1								100	
Specialized Education	Exercise of Mathematics	2	Elective	1semester				100	1								100	
Specialized Education	Basic Engineering Computer Programming	2	Required	1semester				33	1					33	1	34	1	
Specialized Education	Exercise of Technical English	1	Required	1semester										100	1		100	
Specialized Education	Civil and Environmental Engineering and Engineer's Ethics	2	Elective	1semester						33	1	33	1	34	1		100	
Specialized Education	Strength of Materials	2	Required	1semester			100	1									100	
Specialized Education	Exercise of Strength of Materials	1	Elective	1semester				100	1								100	
Specialized Education	Structural Mechanics	2	Required	1semester			100	1									100	
Specialized Education	Exercise of Structural Mechanics	1	Elective	1semester				100	1								100	
Specialized Education	Hydraulics	2	Required	1semester			100	1									100	
Specialized Education	Exercise of Hydraulics	1	Elective	1semester				100	1								100	
Specialized Education	Soil Mechanics	2	Required	1semester			100	1									100	
Specialized Education	Exercise of Soil Mechanics	1	Elective	1semester				100	1								100	
Specialized Education	Materials Science	2	Required	1semester			50	1		50	1						100	
Specialized Education	Fluid Mechanics	2	Required	1semester			50	1		50	1						100S4	

Curriculum Map

Program of Civil and Environmental Engineering

