Appended Form 1

Specifications for Major Program

Name of School (Program) School of Engineering,Cluster 4 (Social and Environmental Engineering)

Program name (Japanese)	
(English)	Program of Civil and Environmental Engineering

1. Academic degree to be Acquired Bachelor's degree in Engineering

2. Overview

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 of 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.

3.Academic Awards Policy (Policy for awarding degrees and goal of the program)

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.

(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

(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

(C) The ability to configure problems: The ability to organize problems logically and construct technical issues

(D) The ability to analyze problems: The ability to gather the necessary data, and to abstract, model, and analyze technical issues

(E) The ability to evaluate: The ability to propose multiple solutions, predict outcomes, and evaluate relative merits

(F) Communication abilities: The ability to communicate to others the details of the proposed solutions, their rationale, their effects, and their feasibility

(G) Implementation and problem-solving abilities: The ability to implement problem-solving processes in cooperation with other people, by making full use of a wide range of general knowledge and a broad perspective, as well as the ability to identify problems, the ability to configure problems, the ability to analyze problems, comprehensive communication abilities, and the ability to enhance problem-solving abilities voluntarily and continuously by learning the above processes,

4. Curriculum Policy

The abilities required to achieve the seven goals (a wide range of general knowledge and a broad

perspective, the ability to identify issues, the ability to configure problems, the ability to analyze problems, the ability to evaluate, communication abilities, and implementation and problem-solving abilities) are described below. The curriculum is organized in such a way that these abilities may be cultivated as required by engineers in civil and environmental engineering. Learning outcomes are evaluated based on the grade calculation for each subject and the level of attainment against the goals.

(A) Wide range of general knowledge and broad perspective

Required abilities: the ability to view the expanding and increasingly complex societies and natural environments from multiple scientific perspectives, such as nature, humanities, and society

The ability to explain the current status of the natural environment and expected environmental problems

The ability to give examples where different scientific findings on the same subject conflict

The ability to list multiple scientific facts relevant to the resolution of research tasks

Applicable subjects: liberal arts education subjects, Graduation Thesis

(B) Ability to identify issues

Required abilities: the ability to understand the relationship between nature, humankind, and technology in the international and regional communities, and the ability to identify issues

The ability to understand the characteristics of civil engineering structures and the surrounding environment, and to list possible natural phenomena and disasters

The ability to explain the roles that civil engineering has played in coexistence with the environment

The ability to position the existing technology related to research tasks, and to set goals

Applicable subjects: liberal arts education subjects, specialized basic subjects such as “Fundamentals of Environmental Science”, and “Infrastructure Planning”, specialized subjects such as “Design of Infrastructures”, and “Project Management in Civil and Environmental Engineering”, Graduation Thesis

(C) Ability to configure problems

Required abilities: the ability to organize problems logically and construct technical issues

The ability to use knowledge about mathematics and physics, and select equation systems that control major elements of phenomena

The ability to mathematically express and understand diverse phenomena, including disasters

The ability to accurately explain the major elements constituting phenomena which are the subject of study

Applicable subjects: specialized basicl subjects such as “Strength of Materials”, “Structural Mechanics” “Hydraulics”, “Soil Mechanics”, and “Experiments in □ and M

(F) Communicating abilities

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

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

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

The 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.

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

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

The 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

A (Superior:80-89 points)	
B (Good: 70-79 points)	
C (Fair: 60-69 points)	1

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

* See the relationship between evaluation items and evaluation criteria in the attached sheet 2.

* See the relationship between evaluation items and class subjects in the attached sheet 3.

* See the curriculum map in the attached sheet 4.

9. Graduation Thesis (Graduation Research) (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.

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

7. In mid-February of the fourth year, the final presentation meeting is held.

○ How academic results are evaluated

(1) Using research daybooks, seminar materials, research notebooks, related literature, and experiment reports, and others documents prepared by the students as a reference, the chief (supervisor) checks whether time has been devoted to study on a regular basis in a way that enhances problem-solving abilities voluntarily and continuously, and whether research has been conducted, and the supervisor evaluates the learning and research attitudes during the year (goals of the course 1-6).

(2) The deputy-head evaluates the attainment levels of the goals 1-6 of the course, based on the submitted theses.

(3) Furthermore, in the mid-term and final presentation meetings, multiple teachers in attendance evaluate mainly the attainment level of goal 5 of the course.

Students who have earned a rating of 60% or more in the above points (1), (2), and (3) are regarded as having passed and are awarded credit.

Other

The graduation research is a comprehensive course aimed at cultivating implementation and problem-solving abilities while developing each ability by using cultivation, the ability to identify challenges, the ability to configure problems, the ability to analyze problems, the ability to evaluate, and the communication abilities acquired through taking the courses in the Program of Civil and Environmental Engineering of Cluster 4 (construction and environment), School of Engineering, Hiroshima University.

Based on the submitted theses and presentation content, the acquisition status of the abilities (1-6) which graduates of this program must acquire, are evaluated in a comprehensive manner.

10. Responsibility System

(1) PDCA responsibility system (“Plan,” “Do,” “Check,” and “Act”)

To check and improve this program, the following two PDCA systems have been created.

PDCA system for checking and improving each class subject and related subject

PDCA system to check and improve the whole educational program, including educational goals and the image of students that is sent out

(2) Program evaluation

In cooperation with the academic affairs committee overseeing the educational assessment and improvement of the whole School of Engineering, the educational program assessment and improvement committee was created, under which the examination working group for each subject and the external advisory committee are established, and each implements educational assessment and evaluation according to the above two PDCA systems,

The educational program assessment and improvement committee checks the establishment of learning and educational goals and the disclosure of these. By getting a picture of the operational status of the assessment and improvement system, mainly undertaken by the examination working group for each subject, the committee checks the amount of learning and education, the educational tools, educational environment, and attainment of learning and educational goals. This committee improves the educational system by undertaking 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

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	No. of credits	Type of course registratio	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 Courses				2		2	Compulsory elective																
	Common Subjects	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	2	Required																
		Area Courses			4	Courses in Arts and Humanities/Social Sc	2	Compulsory elective																
					4	Courses in Natural Sciences	2																	
		Foreign Languages	English (Note2 3)	Basic English Usage	0	Basic English UsageI	1	Free elective																
						Basic English UsageII	1																	
				Communication I	2	CommunicationI	1	Required																
						Communication I5	1																	
				Communication	2	Communication II	1	Required																
						Communication II5	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	Elements of Information Literacy or Exercise in Information Literacy	2	Compulsory elective																
		Health and Sports Cou			2		1or 2	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 5	1																	
						Experimental Methods and Laboratory Work in Physics II Note 5	1																	
	Free elective subjects				6	From all Subject Type Note		Free elective																
	No. of credits required for graduation				46																			

Note 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 to be issued every

Note The credit obtained by mastery of "English-speaking Countries Field Research" or 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 or if application is made in advance. For more details, please refer to the article on English in Liberal Arts Education in the student handbook.

Note 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 Students 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."

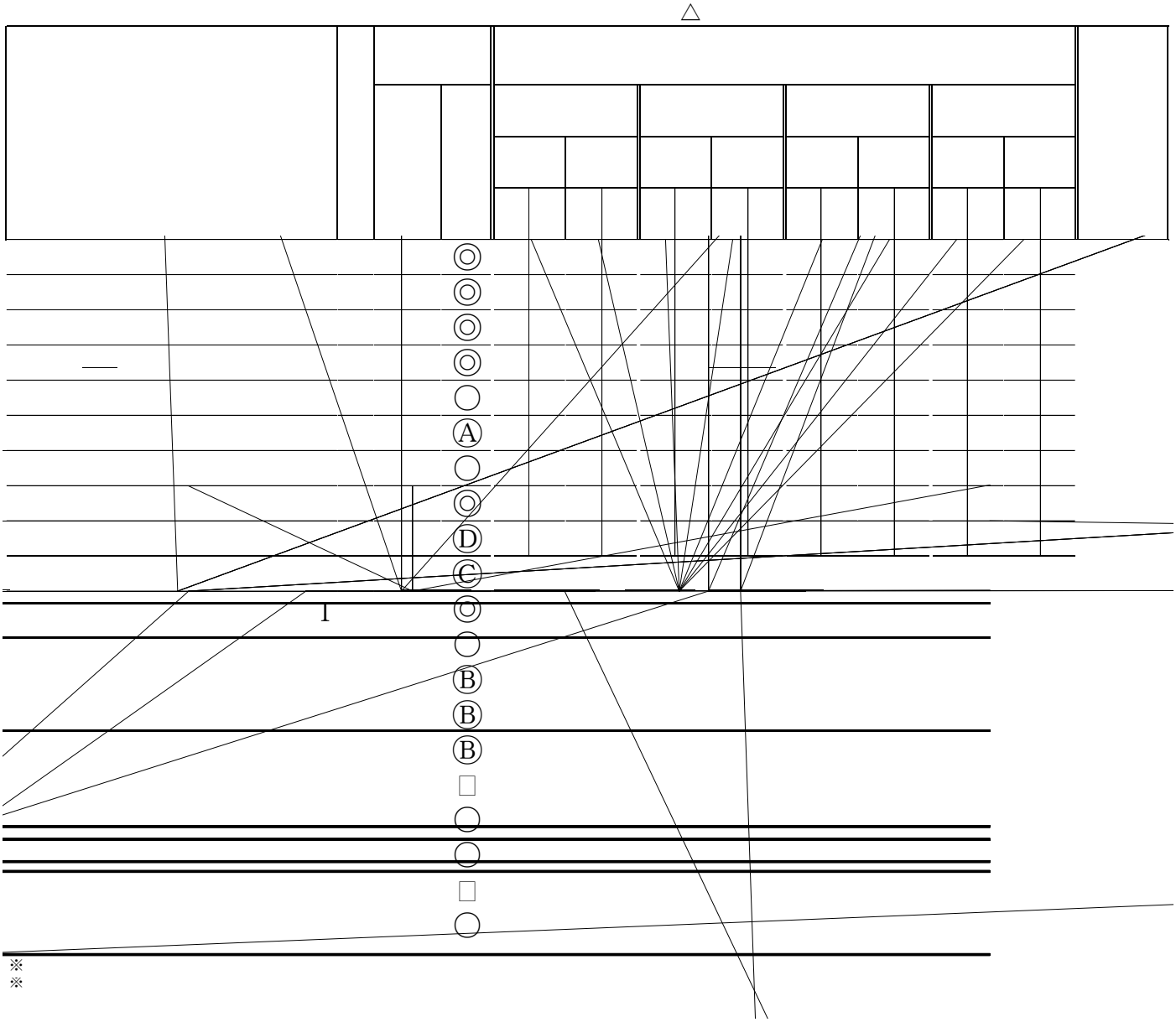
Note Students must take both Experimental Methods and Laboratory Work 1credit and Experimental Methods and Laboratory Work

Note Students can calculate the credits of Basic English Usage.

◎
①, ②, ③
○, Ⓐ, Ⓑ, Ⓒ, Ⓓ
△

		◎	◎																	
		①	○																	
		①	○																	
		①	○																	
		①	○																	
			○																	※
		◎	◎																	※
		①	○																	
			◎																	
		③	○																	
		③	○																	
		①																		
		◎																		
		◎																		
		◎																		
		②																		
		◎																		
		②																		
		◎																		
		②																		
		◎																		
		②																		
		◎																		
		◎																		
		◎																		
		◎																		
		◎																		
		◎																		
		◎																		
		△																		
		◎																		
			◎																	
			Ⓓ																	
			Ⓐ																	

◎
①, ② , ③
○, Ⓐ , Ⓑ , Ⓒ , Ⓓ
△



※
※

(　　)

◎
○
△

		○																	
		○																	
		○																	
		○																	
		○																	
		△																	
		△ ○																	
		○																	
		○																	
		○																	
		○																	
		○																	
		○																	
		○																	
		△																	
		△																	
		△																	
		○																	
		◎																	
		◎																	
		◎																	

Sheet

	A																		
	B																		
	A																		
	B																		
	·Ⅱ																		

Curriculum Map

Program of Civil and Environmental Engineering

Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall
Introductory Seminar for First-Year Students(◎) Peace Science Courses(○) Area Courses(○) Free elective subjects (△) Health and Sports Courses(○) Communication IA(◎) Communication IB(◎) Basic language I(○) Basic language Ⅱ(○)	Peace Science Courses(○) Area Courses(○) Free elective subjects (△) Lifestyle and the city(○) Creation of Architectural Space(○) Communication IIA(◎) Communication IIB(◎)	Free elective subjects (△)	Free elective subjects (△)			Graduation Thesis(◎)	Graduation Thesis(◎)
		Materials Science(◎) Fluid Mechanics(◎) Strength of Materials(◎)	Fundamentals of Environmental Science(◎) Concrete Engineering(◎) Soil Mechanics(◎) Structural Mechanics(◎) Infrastructure Planning(◎) Hydraulics(◎)	Experiments in Civil and Environmental Engineering(◎) Reinforced Concrete Mechanics and Exercises(○) Sanitary and environmental engineering and exercise(○) Geotechnical Engineering(○) Environmental Hydraulics(○) Transportation System Engineering(○)	Design of Infrastructures(◎) Bridge and Earthquake-resistance(○) Disaster Prevention Geotechnology(○) River Engineering(○) Coastal Engineering(○) Fundaments of Environmental Engineering(○) Energy Method for Structural Analysis(○) Urban and Regional Engineering(○)	Graduation Thesis(◎) Maintenance Engineering of Structures(△) Hydrology and Water Resource Engineering(△) Meteorology(△) Ecology and civil engineering(△) Environmental Chemistry of Concrete(△)	Graduation Thesis(◎)
CalculusI(◎) Linear AlgebraI(◎) General Mechanics I(◎) Seminar in Basic Mathematics II(◎)	CalculusII(◎) Linear AlgebraII(◎) Applied Mathematics I(◎) General Mechanics II(◎) Seminar in Basic Mathematics II(◎)	Applied Mathematics II(○) Applied Mathematics III(○) Probability and Statistics(○) Experimental Methods and Laboratory Work in Physics Ⅰ・Ⅱ(◎) Land Survey(◎) Exercise of Surveying(◎) Exercise of Strength of Materials(○)	Synthesis of Applied Mathematics(○) Exercise of Soil Mechanics(○) Structural Mechanics(◎) Hydraulics(◎) Basic Engineering Computer Programming(◎)	Engineering Mathematics A(○) Exercise of Mathematics(○) Experiments in Civil and Environmental Engineering(◎) Reinforced Concrete Mechanics and Exercises(○) Sanitary and environmental engineering and exercise(○) Geotechnical Engineering(○) Environmental Hydraulics(○) Transportation System Engineering(○)	Design of Infrastructures(◎) Bridge and Earthquake-resistance(○) Disaster Prevention Geotechnology(○) River Engineering(○) Coastal Engineering(○) Fundaments of Environmental Engineering(○) Urban and Regional Engineering(○) Exercises in Algorithm(○) Energy Method for Structural Analysis(○)	Graduation Thesis(◎)	Graduation Thesis(◎)
Introductory Seminar for First-Year Students(◎) Peace Science Courses(○) Health and Sports Courses(○)	Lifestyle and the city(○) Creation of Architectural Space(○) Peace Science Courses(○)	Materials Science(◎) Fluid Mechanics(◎)	Fundamentals of Environmental Science(◎) Concrete Engineering(◎) Infrastructure Planning(◎)		Civil and Environmental Engineering and Engineer's Ethics(◎) Design of Infrastructures(◎) Project Management in Civil and Environmental Engineering(◎) Field Work at Construction Sites(△)	Graduation Thesis(◎) Maintenance Engineering of Structures(△) Hydrology and Water Resource Engineering(△) Meteorology(△) Ecology and civil engineering(△) Environmental Chemistry of Concrete(△)	Graduation Thesis(◎)
		Exercise of Surveying(◎)		Experiments in Civil and Environmental Engineering(◎)			