

Appended Form 1

Specifications for Major Program

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

Program name (Japanese)	会基学プログラム境
(English)	Program of Civil and Environmental Engineering

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

2. Overview

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

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

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

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

(2) Program overview of "Program of Civil and Environmental Engineering".

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.

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. In the curriculum, teaching and learning will be implemented by utilizing conventional learning and online classes, depending on the delivery method.

Hydraulics”, specialized subjects such as “Energy Method for Structural Analysis”, and “Reinforced Concrete Mechanics and Exercises”, Graduation Thesis

(E) Ability to evaluate:

○Required abilities: the ability to propose multiple solutions, predict outcomes, and evaluate relative merits

• The ability to consider the applicability to actual phenomena of theoretically-gained solutions, and their limitations

• The ability to design multiple alternative solutions, predict outcomes, and compare

• The ability to explain knowledge gained from research and 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

• 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.

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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

* 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.

2. In early March of the third year, how assignment and graduation theses in each educational course are conducted is explained.

3. At the end of March of the third year, after judging students' qualification to embark on a graduation thesis, where to assign students who meet the required standard is decided at an explanatory meeting.

4. How to proceed with graduation research varies depending on subject of research in educational course. Students begin with literature research, attend seminars, conduct surveys and experiments, and continue to work actively on research under the guidance of their supervisors. (The supervisors evaluate annual learning and research attitudes in mid-February.)

5. At the end of November or at the beginning of December of the fourth year, a mid-term meeting about students' progress is held.

6. At the beginning of February of the fourth year, students submit their theses to two examining teachers (head/deputy head).

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					Require d No. of credits	Class subjects		No. of credits	Type of course registratio n	Year in which the subject is taken(*The lower figure means semester) Note 1																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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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 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 Foreign Language in Liberal Arts Education in the student handbook.

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

Cluster 4 Specialized Basic Subjects

Required subjects

Compulsory Elective subjects

Request Subjects

[illegible]

Required subjects

Compulsory Elective
subjects

Request Subjects

Class Subjects	Credits	Type of course registration		Class Hours/ Week																Note
		Civil and Environmental Engineering	Architecture and Building Engineering	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	

Required subjects
Compulsory Elective subject
Free elective subject

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Reinforced Concrete Mechanics and

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	(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 from cross-disciplinary point of views such as nature, culture and society.	Being able to consider a society and its natural environment from cross-disciplinary perspectives such as nature, the humanities, and community.
	(1)	Ability to structuralize problems	Based on knowledge of mathematics or physics, -being able to structuralize technical problems by organizing the knowledge logically.	Being able to organize problems logically and explain them based on knowledge of mathematics or physics.	Being able to understand the relations between mathematical or physical equations and the problem.
Abilities and Skills	(2)	Ability to analyze problems	By collecting necessary information, being able to abstract and simulate technical problems and to be able to analyze them.	By collecting necessary information, being able to abstract and simulate technical problems and to be able to analyze them.	By collecting necessary information, being able to analyze technical problems.
	(1)	Ability to discover problems	Being able to understand the relationship among nature, human beings and technology in international society regional society and being able to discover issues in them.	Being able to understand the relationship among nature, human beings and technology in international society regional society and being able to find an issue in them.	Being able to understand the relationships among nature, humans, and technology in regional society.
Overall Abilities	(2)	Ability for evaluation	Being 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.
	(3)	Abbility of communication	Being able to present the contents, reasonableness, effect, and feasibility of a proposed solution to other people.	Being able to present the contents and reasonableness of proposed solutions to other people.	To be able to present the contents of proposed solutions.
	(4)	Ability to achieve and ability to solve the problem	Being able to handle the problem-solving process with the best use of available knowledge, understanding, ability and skills under the collaboration with others and being to improve ability to solve problems and ability to achieve, voluntarily and continuously.	Being 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. Seminar, built on specialized subject group, constitute the second cycle and cultivate the applicable abilities associated with the learning outcomes and the abilities required to proceed graduation research. Graduation thesis, as the third cycle, enhances the abilities associated with the learning outcomes in a

	1st Grade		2nd Grade		3rd Grade		4th Grade	
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall
A General culture and breadth of vision	Introductory Seminar for First-Year Students Peace Science Courses Package Courses Area Courses Communication I Basic language I Health and Sports Courses	Peace Science Courses Package Courses Area Courses Communication II Basic language II Health and Sports Courses	Area Courses Communication III	Area Courses Communication III				
B Ability to discover problems	Introductory Seminar for First-Year Students Peace Science Courses	Peace Science Courses					Project Management in Civil and Environmental Engineering	
C Ability to structuralize problems		Lifestyle and the city Creation of Architectural Space			Applied Surveying and Advanced Measurements			
D Ability to analyze problems	Calculus I Linear Algebra I Mathematics Exercises I General Mechanics I	Calculus II Linear Algebra II Mathematics Exercises II General Mechanics II Applied Mathematics I	Physics Experiments Applied Mathematics II Applied Mathematics III Probability and Statistics Mathematics of Civil Engineering		Applied Mathematics A			
E Ability for evaluation			Land Surveying and Exercise Land Surveying and Exercise	Basic Engineering Computer Programming	Applied Surveying and Advanced Measurements			
F Ability of communication	Introductory Seminar for First-Year Students Communication I Second foreign language Information and Data Science Courses	Communication II Second foreign language	Communication III Land Surveying and Exercise	Communication III Basic Engineering Computer Programming	Technical English			
G Ability to achieve and			Land Surveying and Exercise	Basic Engineering Computer Programming				