# For entrants in AY 2024

# Appended Form 1

# Specifications for Major Program

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

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Program name (Japanese)	会基	境	学プログラム			
(English)	Program	of Civ	vil and Environm	nental Engineering		
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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".

n 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. In the curriculum, teaching and learning will be implemented by utilizing active learning and online classes, depending on the deli (i)-ee1 (m)-24e cl

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

#### (E Ability to evaluate:

- ORequired 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 an its applicability, and the limitations and social significance of civil engineering technology
- OApplicable subjects: specialized subjects such as "Design of Infrastructures", and "Civil and Environmental Engineering and Engineer's Ethics", Graduation Thesis

#### (F) Communicating abilities

- ORequired 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
- OApplicable 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:
- ORequired 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
- O 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 examination for national certification as professional engineers. By completing the program, students are certified as assistant surveyors. Other relevant licenses are those for professional engineers, civil engineering works implementation management engineers, concrete engineers, senior concrete engineers, concrete diagnosis engineers, qualified engineers of the Society of Civil Engineers, operations chiefs of every kind, construction machine operation engineers, and real estate surveyors. By meeting all of the requirements, students can obtain these licentiates.

#### 7. Class Subjects and Course Content

 $\ensuremath{^{\star}}$  For class subjects, see the subject list in the attached sheet 1.

(subject list to be attached.)

- \* For course content, see the syllabus published every academic year.
- \* All courses are taught in Japanese. Course materials may be written in both Japanese and English or only 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	Converted
achievement	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

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- 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 begging 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)

a	1- *	ect Ty		Require	Class a livet	No. of credits	Type of course registratio		r in v		the	e subjec		aken	(*The	lowe	er fig		neans	seme	ester)		
5	ubje	ect 1y	pe	d No. of credits	Class subjects	No.	Typ cou	Spr	ing	Fa	all	Spr	ing	Fε	all	Spr	ing	F	all		ing		
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Pea	ice S	cience	Courses	2		2	Compuls ory elective								)								
urses rsity	Uni		Education	2	Introduction to University Education	2	Require d																
Basic Courses in University Education		oducto First-Y	ory Seminar Tear	2	Introductory Seminar for First-Year	2	Require d																
Bau	Adv	anced S	Seminar	0	Courses in Arts and	1	Free elective							\		_			4	V	7		
	Are	a Cour	'ses	4	Humanities/Social Sc Courses in Natural	2	Compuls ory							)		<u>)</u>							
				4	Sciences	2	elective								)		)						
			Basic English	0	Basic English UsageI	1	Free elective											V					
			Usage		Basic English UsageII	1	elective												4	V	7		
cts	ages	English (Note2 3)	Communic	2	CommunicationI	1	Require	4	A														
Common Subjects	angn	Eng (Not	ation I	_	Communication I	1	d																
	Foreign Languages		Communic	2	Communication II	1	Require d		Α	1													
Com	Fore		ation	2	Communication II	1	d∏																
		(Select or	reign Languages le language from French, Spanish,	2	1 subjects from Basic language I	1	Compuls							)									
			Chinese, Korean	2	1 subjects from Basic language II	1	ory elective								)								
		rmation nce Cou	and Data rses	2	Introduction to Information and Data Sciencies	2	Requir ed																
		lth an irses	d Sports	2		1or 2	Compuls ory elective							X	X	X	$\bigcirc$						
	1				CalculusI	2																	
					CalculusII	2																	
					Linear AlgebraI	2																	
					Linear AlgebraII	2																	
	D.			10	Seminar in Basic Mathematics I	1	Require d																
	Basi	ic Subj	ects	16	Seminar in Basic Mathematics II	1																	
					General Mechanics I	2																	
					General Mechanics II  Experimental Methods and	2																	
					Laboratory Work in	1																	
					Experimental Methods and Laboratory Work in	1														_	_	_	
			ubjects	6	From all Subject Type Note 5		Free elective			)							Z	$\bigvee$	$\bigvee$	$\bigvee$	$\bigvee$	$\bigvee$	$\bigvee$
No. of		dits 1 aduatio	required for on	46																			

Note: When students fail to acquire the redit 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 1 credit and Experimental Methods and Laboratory Work 1 credit .

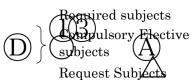
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# Cluster 4 Specialized Basic Subjects

Request Subjects

Request Subjects

		/IV	- (*	1											Re	que	st S	ubj	ect\	
		Type of course registration						$\mathbf{C}$	las	s F	Ιοι	ars	s/ V	Ve	ek					
Clara Calairata	dits			1s	t g	gra	de	2r	ıd ş	gra	de	3r	d g	gra	de	4t	h g	gra	de	NT 4
Class Subjects	Credits	Civil and Environmental Engineering	ecture Fugin	Spi	ring	F	all	Spi	ring	Fa	all	Spi	ing	Fa	all	Spi	ing	F	all	Note
	•	Cir Envir Eng	Architecture and Building Engineering	1T	2T	3Т	4T	1T	2T	3Т	4T	1T	2T	ЗТ	4T	1T	2T	3T	4T	
Applied Mathematics I	2					4														
Applied Mathematics II	2							4	L			)								
Applied Mathematics III	2								$\sqrt{4}$			,								
Engineering Mathematics A	2								$\bigcup$	$\mathcal{J}$		$I_4$								
Probability and Statistics	2							4	$\bigcup$	$\mathcal{J}$	(	)								
Environmental Theory	2									2	2	,		2	2					<b>X</b>
Basic Engineering Computer Programming	2									4		4								<b>X</b>
Synthesis of Applied Mathematics	2								$\bigcup$			_								
Creation of Architectural Space	2					4	6.				(	)								
Lifestyle and the city	2					4	6.	<b>)</b>			(	)								
Introduction of Civil and Environmental Engineering	2							4												
Mathematics of Civil Engineering	2								$\Phi$	Ĺ										
Strength of Materials	2								4											
Exercise of Strength of Materials	1								4											
Structural Mechanics	2									4										
Exercise of Structural Mechanics	1									4										
Hydraulics	2										4									
Soil Mechanics	2										4									
Exercise of Soil Mechanics	1										4									
Construction Materials	2								4											
Concrete Engineering	2									4										
Fluid Mechanics	2									4										
Exercise of Fluid Mechanics	1									4										
Infrastructure Planning	2										4									
Environmental Chemistry for Atmosphere and Water	2							4												
Microbiology and Ecology for Engineering	2								4											
Land Surveying and Exercise	3							8												
Applied Surveying and Advanced Measurements	2												4							
Field Work at Construction Sites	1													44	<u> </u>	7				
Experiments in Civil and Environmental Engineering	2												8							
Building Material	2									4										
Experiments on Building Materials	1		(L									3	3		_					
Introduction of Building Structure	2								4	ļ				y	H	7				



Class Subjects		Type cour registr	se					Cl	as	s I	lot	ars	/ V	Ve	ek	•				
	dits	id ental ing	and neering	1s	t g	grade		2nd g		grade		3rd g		grade		4th		grade		Note
	Cre	ivil an ronme gineer	itecture ng Engin	Spr	ing	Fa	ıll	Spr	ing	Fa	all	Spr	ing	Fa	all	Spi	ing	Fa	all	11000
		C Envi En	Arch Buildir	1T	2T	3Т	4T	1T	2T	ЗТ	4T	1T	2T	ЗТ	4T	1T	2T	3Т	4T	

Required subjects
Compulsory Elective subject
Free elective subject



# 1T2T3T4T1T2T3T4T1T2T3T4T

		1121011112	<i>y</i> • • •		
Reinforced Concrete Mechanics and Exercises	3		$\searrow$	8	
Geotechnical Engineering	2		$\searrow$	4	
Seismic Analysis and Design of Bridges	2		$\bigcup$	4	^
Disaster Prevention and Mitigation	<b>2</b>		$\overline{}$		4
Energy Methods for Structural Analysis	2		$\bigcup$	4	^
Maintenance Engineering of Structures	2				4
Environmental Chemistry of Concrete	2				$\triangle$
Water and Wastewater Engineering and Exercises	3			8	
Environmental Hydraulics	2			4	
Transportation System Engineering	2		$\bigcup$	4	
Coastal Engineering	2				

# Academic Achievements in Civil and Environmental Engineering The Relationship between Evaluation Items and Evaluation Criteria

A	cad	lemic Achievements	Evaluation Criteria										
	E	valuation 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 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.								
Abilities and Skills	(1)	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.								
Abilit Sk	(2)	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.								
	(1)	Ability to discover problems	To be able to understand the relationship among nature, human beings and technology in international society 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								
ilities	(2)	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.								
Overall Abilities	(3)	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.								
Ove	(4)	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 at 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 reuired to proceed graduation research. Graduation thesis, as the third cycle, enhances the abilities associated with the learning outcomes in a

					Weighted values of evaluation items in	Weightsed values of evaluation items													
					the subject		the subject		the subject		the subject		the subject		the subject		the subject		
	Introductory Seminar for First-Year Students	2	Required	1semsester	33	1					33	1			34	1			100
	Peace Science Courses CommunicationI	2	Required Required	1 semsester 1semsester	50 50	1 1					50	1			50	1			100 100
Liberal Arts Education		1		1semsester	50	1									50	1			100
Liberal Arts Education	Communication II	1	Required	semsester	50	1									50	1			100
	Communication II	1	Required	semsester	50	1									50	1			100
Liberal Arts Education	Basic language I Basic language II	1	Required Required	1semsester	50 50	1 11									50 50	1 1			100 100
Liberal Arts Education		2	Required	semsester 1semsester	50	1.1									100	1			100
Liberal Arts Education	Area Courses	2	Elective	1 semsester	100	1													100
Liberal Arts Education	11cc ciccure subjects	6	Elective	1 semester	100	1													100
Liberal Arts Education Liberal Arts Education	Health and Sports Courses CalculusI	2	Required Required	1 semsester	100	1			100	1									100 100
Liberal Arts Education		2	Required	semsester					100	1									100
	Linear AlgebraI	2	Required	1semsester					100	1									100
	Linear AlgebraII	2	Required	semsester					100	1									100
Liberal Arts Education	Seminar in Basic Mathematics I	1	Required	1semsester					100	1									100
Liberal Arts Education	Seminar in Basic Mathematics II	1	Required	semsester					100	1									100
Liberal Arts Education Liberal Arts Education	General meenames r	2	Required Required	semsester					100 100	1 1									100 100
Liberal Arts Education	Goneral Moonanio II	1	Required	semsester		3			100	1									100
Specialized Education	Creation of Architectural Space	2	Elective	semsester	50	1					50	1							100
Specialized Education	Lifestyle and the city	2	Elective	semsester	50	1					50	1							100
Specialized Education		2	Required	semsester					100	1									100
Specialized Education	Applied Mathematics II	2	Elective	semsester		3			100	1									100
Specialized Education Specialized Education	Applied Mathematics III	2	Elective	semsester		3			100	1									100
Specialized Education	Engineering Mathematics A Probability and Statistics	2	Elective Elective	semsester		5 3			100 100	1 1									100 100
Specialized Education	Synthesis of Applied Mathematics	2	Elective	semsester 4semsester		J			100	1									100
Specialized Education	Mathematics for Civil Engineering	2	Elective	semsester		3			100	1									100
Specialized Education	Basic Engineering Computer Programming	2		4semsester					33	1					33	1	34	1	100
Specialized Education	Introduction of Civil and Environmental Engineering	2	Required		m	e <b>3e</b> e	S <b>56</b>	1			50	1							100
Specialized Education		1	Required	semsester		5									100	1			100
Specialized Education	Strength of Materials	2	Required	semsester		3	100	1											100
Specialized Education Specialized Education	Exercise of Strength of Materials	1	Elective	semsester 4semsester		3	100	1	100	1									100
	Structural Mechanics Exercise of Structural Mechanics	2		4semsester 4semsester			100	1	100	1									100 100
	Hydraulics	2		4semsester			100	1	100	1									100
Specialized Education	Exercise of Fluid Mechanics	1		4semsester			100		100	1									100
Specialized Education	Soil Mechanics	2	Required	4semsester			100	1		_									100
Specialized Education		1	Elective	4semsester					100	1									100
Specialized Education	Construction Materials	2	Required	semsester		3	50	1			50	1							100
Specialized Education		2	Required	semsester		3	100	1											100
Specialized Education		2	Required	4semsester			50	1			50	1							100
Specialized Education		2	Required	semsester	m	3 e3ee	50	1			50 50	1							100
Specialized Education  Specialized Education	Microbiology and Ecology for Engineering Infrastructure Planning	2	Required Required	4semsester	111	Curc	S 58	1 1			50 50	1 1							100 100
Specialized Education		2 3	Required	semsester		3	50	1	40	1	15	1	15	1	15	1	15	1	100
	Applied Surveying and Advanced Measurement	2	Required	semsester		5	50	1			50	1		•					100
Specialized Education		4	Required	semsester		5		1	16	1	17	1	17	1	17	1	17	1	100
	Field Work at Construction Sites	1	Elective	semsester							25	1	25	1	25	1	25	1	100
Specialized Education	Energy Methods for Structural Analysis	2	Elective	6semsester		_	50	1	50	1									100
Specialized Education	Geotechnical Engineering Reinforced Concrete Mechanics and Exercises	2	Elective Elective	semsester		5 5		1 1	50 50	1 1									100 100
	Disaster Prevention and Mitigation	2	Elective	semsester semsester		J	50	1	50	1									100
	Bridge and Earthquake-resistance	2	Elective	semsester		5		1	50	1									100
Specialized Education	Maintenance Engineering of Structures	2	Elective								100	1							100
	Environmental Chemistry of Concrete		Elective		GoE (	,		100000			100	1							100
Specialized Education	Environmental Hyw 5BDC fo	)OM(	UID 3 <b>6</b>	O BD	U37 (n	v)-oncr	etew 5F	SETE8											

