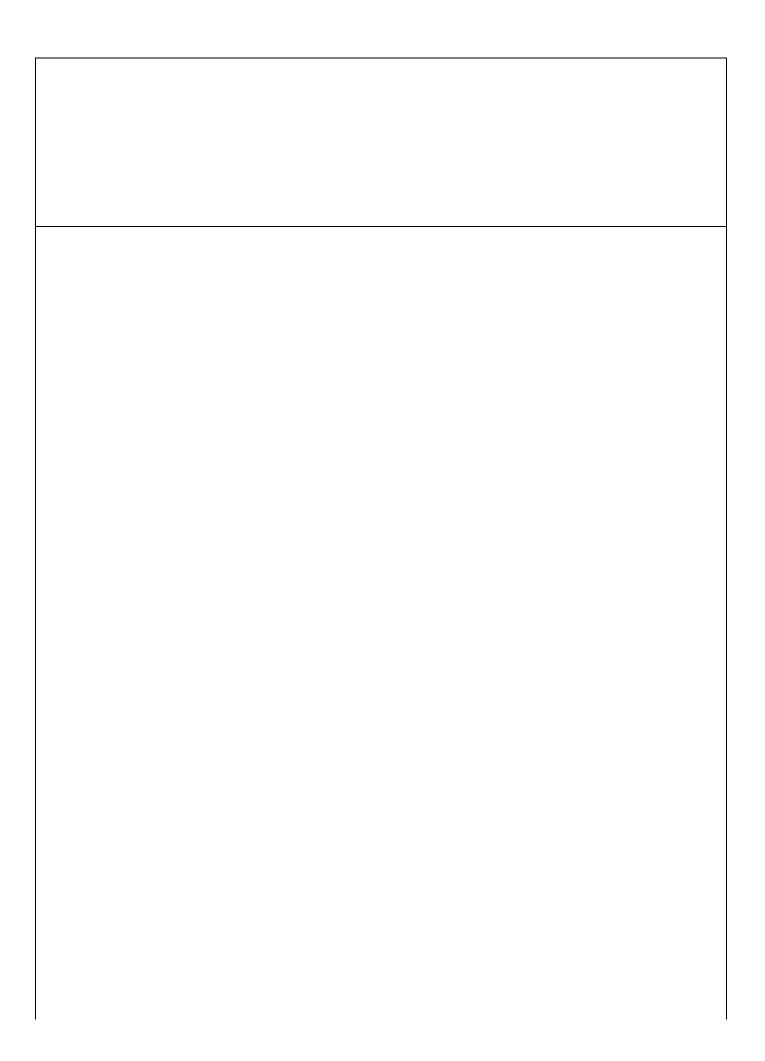
### Specifications for Major Program



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Start of the Program
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Pos	sition		
Tim	ne and method of assignr	nent	
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Method of assignment
Guidance on preparing a graduation thesis
(5) Read an English book in turn with other students and exchange opinions, and introduce the abstract of
Responsibility system
Reviewing Committee (hereinafter, "Program Reviewing
Program Reviewing Committee establishes a loop of improvement in the PDCA cycle
with each other, with the Chair of the Educational Program Reviewing Committee as
Criteria for Program assessment

Implementing the assessment  The Program Reviewing Committee plays a leading role in assessing and ir	mproving the Program.
explained below. The Program Reviewing Committee examines the validity of	the Program's learning &
three programs. Requests for checks and improvements to these shared necessary, will be proposed to the Cluster 3 Curriculum Reviewing Committee	
Specialized Subject Group Liaison Conference will be proposed to the Program F Program Reviewing Committee, based on these improvement plans, wi	Reviewing Committee. The
Idea and method of feedback to students	

#### Cluster 3 (Applied Chemistry, Biotechnology and Chemical Engineering)

Required subject (period of registration specified)

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

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

							v			г	ree e	iectiv	e sur	gect	(any	or tn	iese s	subje	cts si	naii b	e reg	istere	:a)
	Subject Type No. of credits			Tyne	Required No. of	Class subjects																	
				1 J PC		Class subjects	No. of credits		1T	от	от	<b>4</b> T	1T	от	от	4T	1T	от	от	4T		ing	Fall
								11	21	31	41	11	۷1	31	41	11	21	31	41	11	21	3T 4T	
		Peac	e Scien	ce Courses	2		2	Compulsory elective															
	s in cation		oductio cation	n to University	2	Introduction to University Education	2	Required															
	Basic Courses in University Education			ry Seminar for Students	2	Introductory Seminar for First- Year Students	2	Required															
	Basic Univers	Adv	/anced	Seminar	0		1	Free elective															
		۸	a Cours		4	4 Courses in Arts and Humanities/Social Sc		Compulsory															
		Are	a Cours	ses	4	Courses in Natural Sciences	2	elective															
				Basic English		Basic English Usage I	1	ъ.,															
				Usage	2	Basic English Usage II	1	Required															
	ts	ages	English (Note2 3)	Communication	2	Communication IA	1	Dt I															
	Common Subjects	Foreign Languages	Eng (Note	I	۷	Communication IB	1	Required															
cts	non S	ign L		Communication	2	Communication IIA	1	Danninad															
Subje	Comr	Fore			٤	Communication IIB	1	Required															
ation			(Select	Foreign Languages one language from n, French, Spanish,	2	1 subjects from Basic language I	1	Compulsor															
Educe				, Chinese, Korean	٤	1 subjects from Basic language II	1	y elective															
Liberal Arts Education Subjects			rmation ence Co	n and Data urses	2	Introduction to Information and Data Sciencies	2	Required		0													
ibera		Hea	lth and	Sports Courses	2		1or2	Compulsor y elective															
I		ı				Calculus I	2																
						Calculus II	2															$\neg$	
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					15		2	Required															
						General Mechanics II	2																
		,		1		Experimental Methods and	1																
		1	Basic St	ibjects		Laboratory Work in Physics I Experimental Methods and																$\dashv$	
						Laboratory Work in Physics II	1															_	
				Seminar in Basic Mathematics I	1																		
						Seminar in Basic Mathematics II	1																
					1	Experimental Methods and Laboratory Work in Biology I Note 5	1	Compulsor															
					1	Experimental Methods and Laboratory Work in Biology II	1	y elective															
						Basic Electromagnetism	2								ĺ								
					2	From all Subject Type		Free elective															
					44			ejective		1						1		1	1	1			
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- Note 1 When students fail to acquire the credit during the term or semester marked with in the boxes for the year in which the course is taken, they can take the course in subsequent terms or semesters. Depending on class subject, courses may be offered in semesters or terms different from those scheduled. Please be sure to check the time schedule for Liberal Arts Education subjects to be issued every school year.
- Note 2 The credit obtained by mastery of self-directed study of "Online Seminar in English A B" cannot be counted towards the credit necessary for graduation. The credit obtained by Overseas Language Training can be recognized as Communication 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 3 We have a recognition of credit system for foreign language proficiency tests. For more details, please refer to the article on Foreign Language in Liberal Arts Education in the student handbook.
- Note 4 Students must take both Experimental Methods and Laboratory WorkI in Physics I 1credit and Experimental Methods and Laboratory WorkII in Physics II 1credit .
- Note 5: Experimental Methods and Laboratory Work in Biology I should basically be taken together with Experimental Methods and Laboratory Work in Biology II. Person who took Methods and Laboratory Work in Biology I can take Experimental Methods and Laboratory Work in Biology II.

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Required

	Credits	Applied Chemistry Biotechnolog y Chemical nneenering	Tst grade  Grade  Grade  Fall  T 2T 3T 4T			2nd grade Fall								4th grade Spring					
	0	Biot C	T 2T	3T	<b>4</b> T	1T	2T	3T	4T	1T	2T	3T	<b>4</b> T	1T	2T	3T	<b>4</b> T		
Applied Mathematics I	2			4															
Applied Mathematics II	2					4													
Applied Mathematics III	2										4								
Basic Engineering Computer Programming	2					4													
Probability and Statistics	2									4									
Technical English	1								4										
Basic Environmental Sciences	2			4															
Chemical Stoichiometry	2						4												
Basic Organic Chemistry I	2			4															
Basic Organic Chemistry II	2				4														
Physical Chemistry I	2						4												
Biochemistry I	2						4												
Basic Experiments in Chemistry	4							12	12										
Basic Inorganic Chemistry	2			4															
Analytical Chemistry	2					4													
Basic life science	2				4														
$Introduction\ to\ Applied\ Chemistry,\ Chemical\ Engineering\ and\ Biotechnology$	2						4												
Introduction to Fundamental Industry	2						4												

#### Required subjects Compulsory Elective subjects

### 1T 2T 3T 4T 1T 2T 3T 4T 1T 2T 3T 4T 1T 2T 3T 4T

<b>Inorganic Chemistry</b>	2	4
Advanced Organic Chemistry I	2	4
Exercises in Organic Chemistry	1	4
Exercises in Physical Chemistry	1	4
Advanced Organic Chemistry II	2	4
Physical Chemistry II	2	4
Chemical Experiments I	4	12 12
Chemical Experiments II	4	12 12
Advanced Organic Chemistry III	2	4
Quantum Chemistry I	2	4
Quantum Chemistry II	2	4
Advanced Organic Chemistry IV	2	4
Materials Analysis	2	4
Chemical Kinetics	2	4
Organometallic Chemistry	2	4
Organic Structural Analysis	2	4
Catalysis Chemistry	2	4
Synthetic Polymer Chemistry	2	4
Computaional Chemistry	2	4

#### Academic Achievements in Applied Chemistry

The Relationship between Evaluation Items and Evaluation Criteria

Excellent Very Good Good

Wide range of basic knowledge on
(1) liberal arts and specialized education, and professional basic knowledge on chemistry.

Acquiring the wide range of basic knowledge on liberal arts and specialized education, and professional basic knowledge on chemistry, and being able to explain them.

Acquiring the wide range of basic knowledge on liberal arts and specialized education, and professional basic knowledge on chemistry.

Acquiring the outline of wide range of basic knowledge on liberal arts and specialized education, and professional basic knowledge on chemistry.

(2) Advanced technical knowledge of applied chemistry.

Acquiring the advanced technical knowledge of applied chemi 4 (cq)1.32ny anm s(i).3 41.32nmnn(i).3 41.32c (i).3 41.32pm ci82nmn(Caquiring theke onced techni tobaowlede

	values of	Weightse Weightse val	alues of	Veightse v		Weightse d values	Weighted values of	Weightse d values	Weighted values of	Weightse d values	Weighted values of evaluatio	d volues	Weighted values of evaluatio	d volues	Weighted values of evaluatio	d voluce	Weighted values of evaluatio	Weightse d values	Weighted values of evaluatio	Weightse d values	Weighted values of evaluatio	dwalnes	Weighted values of evaluatio	Weightse d values
	in the	evaluatio n i	the	valuatio in	n items n the		evaluatio n items in the		evaluatio n items in the	of evaluatio n items	n items in the	of evaluatio n items	n items in the	of evaluatio n items	n items in the	evaluatio	n items in the	of evaluatio n items	n items in the		n items in the	evaluatio	n items in the	of evaluatio n items
Liberal Arts Education Introduction to University Education 2 Required Isomore	subject	1	ıbject	s	ubject	n kenis	subject	n acing	subject	ii iiciiis	subject	II IICIII3	subject 20	1	subject 30	1	subject 30	1	subject	ii keins	subject	ii iiciiis	subject	ii iiciiis
Liberal Arts Education latendactory Southear for First-Year Students 2 Required Isomore	× 5	1	5	1	5	1	10	1	10	1	10	1			15	1	10	1	10	1	10	1	10	1
Liberal Arts Education Advanced Seminar 1 Elective 2seman	× 5	1	5	1	5	1	10	1	10	1	10	1			15	1	10	1	10	1	10	1	10	1
Liberal Arts Education Peace Science Courses 2 Elective 1 semant															20	1	20	1	20	1	20	1	20	1
Liberal Arts Education Area Courses 8 Elective 1.20cmo		1			5	1	10	1	5	1	5	1	5	1	10	1	10	1	15	1	15	1	10	1
Liberal Arts Education Basic English Usage I 1 Required 1-semant Liberal Arts Education Basic English Usage II 1 Required 2-semant																					50 50	1	50 50	1
Liberal Arts Education Communication I Required 1 semant																					50	1	50	1
Liberal Arts Education Communication I 1 Required 1semans	er																				50	1	50	1
Liberal Arts Education $$	er																				50	1	50	1
Liberal Arts Education Communication II 1 Required 2semans	er																				50	1	50	1
Liberal Arts Education Basic language I 1 Elective 1800mars	er .																				50	1	50	1
Liberal Arts Education Basic language II 1 Elective 1 semant Liberal Arts Education Information and Data Science Courses 2 Required 1 semant	× 100	1																			50	1	50	1
Liberal Arts Education Health and Sports Courses 2 Elective 1,2002000	100	1																						
Liberal Arts Education CalculusI 2 Required 1semans	·· 100	1																						
Liberal Arts Education CalculusII 2 Required 2semans		1																						
Liberal Arts Education Linear AlgebraI 2 Required issument	·· 100	1																						
Liberal Arts Education Linear AlgebraII 2 Required 2mmer	100	1																						
Liberal Arts Education General Mechanics I 2 Required temperature of the control	100	1																						
Liberal Arts Education General Mechanics II 2 Required 2seman Liberal Arts Education 2 Required 2seman 2 Required 2	= 100 = 80	1													10	1	10	1						
Liberal Arts Education  Engelment literatus mell absence y line in Physics 1-2  Liberal Arts Education  Seminar in Basic Mathematics I  Required Increase  Required I	= 80 = 100	1													10		10							
Liberal Arts Education Seminar in Basic Mathematics II 1 Elective 2seman	·· 100	1																						
Liberal Arts Education Experienced Michael and Laboratory Work in Educatory 2 Elective 2 command	·· 100	1																						
Liberal Arts Education Basic Electromagnetism 2 Elective 2seman	··· 100	1																						
Specialized Education Applied Mathematics I 2 Required 2-means	100	1																						
Specialized Education Applied Mathematics II 2 Required Summer	·· 100	1																						
Specialized Education Applied Mathematics III 2 Elective Summer	× 100	1	40		00																			
Specialized Education    Rusic Engineering Computer Programming    Required Summar  Specialized Education    Probability and Statistics    Elective Summar		1	40	1	20	1																		
Specialized Education Technical English 1 Required 4seman		•																			100	1		
Specialized Education Basic Environmental Sciences 2 Elective 2sumans	·· 40	1	40	1	20	1																		
Specialized Education Chemical Stoichiometry 2 Required 3seman	er 40	1	40	1	20	1																		
Specialized Education Basic Organic Chemistry I $2$ Required 2semants	er 40	1	40	1	20	1																		
Specialized Education Basic Organic Chemistry II 2 Elective 2seman			40	1	20	1																		
Specialized Education Physical Chemistry I 2 Required 3werner  Specialized Education Biochemistry I 2 Required 3werner	× 40		40	1	20	1																		
Specialized Education Biochemistry I 2 Required Summer  Specialized Education Basic Experiments in Chemistry 4 Required 4-memory	= 40 = 20		40 10	1	20 20	1	10	1	10	1					10	1	10	1	10	1				
Specialized Education Basic Inorganic Chemistry 2 Required 2seman	× 40		40	1	20	1	10	•	-10	•						•	10	•	10	•				
Specialized Education Analytical Chemistry 2 Required 3semant	er 40		40	1	20	1																		
Specialized Education Basic life science 2 Elective 2seman	·· 40	1	20	1	40	1																		
Specialized Education	·· 40		40	1	20	1																		
Specialized Education Introduction to Fundamental Industry 2 Elective 3seman	·· 40		20	1	40	1																		
Specialized Education Inorganic Chemistry 2 Required Summer  Specialized Education Advanced Organic Chemistry I 2 Required 4-seman	= 40 = 40		40 40	1	20 20	1																		
Specialized Education Exercises in Organic Chemistry 1 Required 6wman	·· 40 ·· 20		20	1	20	1					10	1	10	1	10	1	10	1						
Specialized Education Exercises in Physical Chemistry 1 Required townson	- 20		20	1	20	1					10	1	10	1	10	1	10	1						
Specialized Education Advanced Organic Chemistry II 2 Required 4seman	× 40		40	1	20	1																		
Specialized Education $\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$	·· 40	1	40	1	20	1																		
Specialized Education Chemical Experiments I 4 Required Summer	= 20		20	1	10	1					10	1	10	1	10	1	10	1	10	1				
Specialized Education Chemical Experiments II 4 Required 6 semant			20	1	10	1					10	1	10	1	10	1	10	1	10	1				
Specialized Education Advanced Organic Chemistry III 2 Required Summer  Specialized Education Quantum Chemistry I 2 Required 4 summer			40	1	20 20	1																		
Specialized Education Quantum Chemistry I 2 Required 4-seman Specialized Education Quantum Chemistry II 2 Required 5-seman			40 40	1	20	1																		
Specialized Education Advanced Organic Chemistry IV 2 Elective 6seman			40	1	20	1																		
Specialized Education Materials Analysis 2 Elective 6semans			40	1	20	1																		
Specialized Education Chemical Kinetics 2 Elective Summar	·· 40	1	40	1	20	1																		
Specialized Education Organometallic Chemistry 2 Elective Sweman			40	1	20	1																		
Specialized Education Organic Structural Analysis 2 Elective 4seman			40	1	20	1																		
Specialized Education Catalysis Chemistry 2 Elective Common			40	1	20	1																		
Specialized Education Synthetic Polymer Chemistry 2 Required General Specialized Education Computational Chemistry 2 Elective Seeman			40 40	1	20 20	1																		
Specialized Education Electrochemistry 2 Elective Summer	·· 40 ·· 40		40	1	20	1																		
Specialized Education Solid State Chemistry 2 Elective 4seman			40	1	20	1																		
Specialized Education Applied Inorganic Chemistry 1 Elective Guerrans	·· 40		40	1	20	1																		
Specialized Education Industrial Polymer Chemistry $2$ Elective Geometric Specialized Education Industrial Polymer Chemistry	·· 40	1	40	1	20	1																		
Specialized Education Bioorganic Chemistry 2 Elective Summar			20	1	40	1																		
Specialized Education Chemical Engineering Exercise I 2 Elective tempor			20	1	40	1																		
Specialized Education Chemical Engineering Fundamentals 2 Elective 4semann Specialized Education Green Technology 2 Elective 6semann			20	1	40 40	1																		
Specialized Education Green Technology 2 Elective fluencers Specialized Education Recycling engineering 2 Elective fluencers			20	1	40	1																		
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## Sheet

#### Curriculum Map of Applied Chemistry

