Specifications for Major Program

○ Start of the Program

○ R

○ Position

○ Time and method of assignment

○ 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 improving 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 subjects, when deemed necessary, will be proposed to the Cluster 3 Curriculum Reviewing Committee, and will

Specialized Subject Group Liaison Conference will be proposed to the Program Reviewing Committee. The Program Reviewing Committee, based on these improvement plans, wi

○ 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)

Subject Type				Required No. of credits	Class subjects	No. of credits		1T	2T	3T	4T	1T	2T	3T	4T	1T	2T	3T	4T	Spring 1T	Spring 2T	Fall 3T	Fall 4T
Liberal Arts Education Subjects	Peace Science Courses			2		2	Compulsory elective																
	Basic Courses in University Education	Introduction to University Education		2	Introduction to University Education	2	Required																
		Introductory Seminar for First-Year Students		2	Introductory Seminar for First-Year Students	2	Required																
		Advanced Seminar		0		1	Free elective																
	Common Subjects	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	2	Basic English Usage I	1	Required																
					Basic English Usage II	1																	
			English (Note2 3) Communication I	2	Communication IA	1	Required																
					Communication IB	1																	
			English (Note2 3) Communication	2	Communication IIA	1	Required																
					Communication IIB	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	Introduction to Information and Data Sciencies	2	Required		◎														
		Health and Sports Courses		2		1or2	Compulsory elective																
	Basic Subjects			15	Calculus I	2	Required																
					Calculus II	2																	
					LiEâpn																		
						2																	
					General Mechanics II	2																	
					Experimental Methods and Laboratory Work in Physics I	1																	
					Experimental Methods and Laboratory Work in Physics II	1																	
					Seminar in Basic Mathematics I	1																	
				1	Seminar in Basic Mathematics II	1	Compulsory elective																
					Experimental Methods and Laboratory Work in Biology I Note 5	1																	
					Experimental Methods and Laboratory Work in Biology II	1																	
					Basic Electromagnetism	2																	
				2	From all Subject Type		Free elective																
				44																			

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 Biotechnology Chemical enneenering	1st grade Fall 1T	2T	3T	4T	2nd grade Fall 1T	2T	3T	4T	1T	2T	3T	4T	4th grade Spring 1T	2T	3T	4T
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
Inorganic Chemistry	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
(1)	Wide range of basic knowledge on liberal arts and specialized education, and professional basic knowledge on chemistrv.	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)17 82ny anm s(i).3 417 82nnmn(i).3 417 0Γc	(i).3 417 pm ci 82nmnn0Γc quiring theke onced techni tobaowlede	

Relationships between the evaluation items and class subjects

					Weighted values of evaluation items in the subject	Weighted values of evaluation items	(2) Weighted values of evaluation items in the subject	Weighted values of evaluation items	(3) Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	Weighted values of evaluation items in the subject	Weighted values of evaluation items	
Liberal Arts Education	Introduction to University Education	2	Required	1semester	20	1											20	1	30	1	30	1							100
Liberal Arts Education	Introductory Seminar for First-Year Students	2	Required	1semester	5	1	5	1	5	1	10	1	10	1	10	1			15	1	10	1	10	1	10	1	10	1	100
Liberal Arts Education	Advanced Seminar	1	Elective	2semester	5	1	5	1	5	1	10	1	10	1	10	1			15	1	10	1	10	1	10	1	10	1	100
Liberal Arts Education	Peace Science Courses	2	Elective	1semester															20	1	20	1	20	1	20	1	20	1	100
Liberal Arts Education	Area Courses	8	Elective	1,2semester	10	1			5	1	10	1	5	1	5	1	5	1	10	1	10	1	15	1	15	1	10	1	100
Liberal Arts Education	Basic English Usage I	1	Required	1semester																					50	1	50	1	100
Liberal Arts Education	Basic English Usage II	1	Required	2semester																					50	1	50	1	100
Liberal Arts Education	CommunicationI	1	Required	1semester																					50	1	50	1	100
Liberal Arts Education	Communication I	1	Required	1semester																					50	1	50	1	100
Liberal Arts Education	Communication II	1	Required	2semester																					50	1	50	1	100
Liberal Arts Education	Communication II	1	Required	2semester																					50	1	50	1	100
Liberal Arts Education	Basic language I	1	Elective	1semester																					50	1	50	1	100
Liberal Arts Education	Basic language II	1	Elective	1semester																					50	1	50	1	100
Liberal Arts Education	Information and Data Science Courses	2	Required	1semester	100	1																							100
Liberal Arts Education	Health and Sports Courses	2	Elective	1,2semester	100	1																							100
Liberal Arts Education	CalculusI	2	Required	1semester	100	1																							100
Liberal Arts Education	CalculusII	2	Required	2semester	100	1																							100
Liberal Arts Education	Linear AlgebraI	2	Required	1semester	100	1																							100
Liberal Arts Education	Linear AlgebraII	2	Required	2semester	100	1																							100
Liberal Arts Education	General Mechanics I	2	Required	1semester	100	1																							100
Liberal Arts Education	General Mechanics II	2	Required	2semester	100	1																							100
Liberal Arts Education	Experimental Methods and Laboratory Work in Physics I-II	2	Required	3semester	80	1													10	1	10	1							100
Liberal Arts Education	Seminar in Basic Mathematics I	1	Required	1semester	100	1																							100
Liberal Arts Education	Seminar in Basic Mathematics II	1	Elective	2semester	100	1																							100
Liberal Arts Education	Experimental Methods and Laboratory Work in Biology I-II	2	Elective	2semester	100	1																							100
Liberal Arts Education	Basic Electromagnetism	2	Elective	2semester	100	1																							100
Specialized Education	Applied Mathematics I	2	Required	2semester	100	1																							100
Specialized Education	Applied Mathematics II	2	Required	3semester	100	1																							100
Specialized Education	Applied Mathematics III	2	Elective	5semester	100	1																							100
Specialized Education	Basic Engineering Computer Programming	2	Required	3semester	40	1	40	1	20	1																			100
Specialized Education	Probability and Statistics	2	Elective	5semester	100	1																							100
Specialized Education	Technical English	1	Required	4semester																					100	1			100
Specialized Education	Basic Environmental Sciences	2	Elective	2semester	40	1	40	1	20	1																			100
Specialized Education	Chemical Stoichiometry	2	Required	3semester	40	1	40	1	20	1																			100
Specialized Education	Basic Organic Chemistry I	2	Required	2semester	40	1	40	1	20	1																			100
Specialized Education	Basic Organic Chemistry II	2	Elective	2semester	40	1	40	1	20	1																			100
Specialized Education	Physical Chemistry I	2	Required	3semester	40	1	40	1	20	1																			100
Specialized Education	Biochemistry I	2	Required	3semester	40	1	40	1	20	1																			100
Specialized Education	Basic Experiments in Chemistry	4	Required	4semester	20	1	10	1	20	1	10	1	10	1					10	1	10	1	10	1					100
Specialized Education	Basic Inorganic Chemistry	2	Required	2semester	40	1	40	1	20	1																			100
Specialized Education	Analytical Chemistry	2	Required	3semester	40	1	40	1	20	1																			100
Specialized Education	Basic life science	2	Elective	2semester	40	1	20	1	40	1																			100
Specialized Education	Introduction to Applied Chemistry, Chemical Engineering and Biotechnology	2	Elective	3semester	40	1	40	1	20	1																			100
Specialized Education	Introduction to Fundamental Industry	2	Elective	3semester	40	1	20	1	40	1																			100
Specialized Education	Inorganic Chemistry	2	Required	5semester	40	1	40	1	20	1																			100
Specialized Education	Advanced Organic Chemistry I	2	Required	4semester	40	1	40	1	20	1																			100
Specialized Education	Exercises in Organic Chemistry	1	Required	6semester	20	1	20	1	20	1					10	1	10	1	10	1	10	1							100
Specialized Education	Exercises in Physical Chemistry	1	Required	6semester	20	1	20	1	20	1					10	1	10	1	10	1	10	1							100
Specialized Education	Advanced Organic Chemistry II	2	Required	4semester	40	1	40	1	20	1																			100
Specialized Education	Physical Chemistry II	2	Required	4semester	40	1	40	1	20	1																			100
Specialized Education	Chemical Experiments I	4	Required	5semester	20	1	20	1	10	1					10	1	10	1	10	1	10	1	10	1					100
Specialized Education	Chemical Experiments II	4	Required	6semester	20	1	20	1	10	1					10	1	10	1	10	1	10	1	10	1					100
Specialized Education	Advanced Organic Chemistry III	2	Required	5semester	40	1	40	1	20	1																			100
Specialized Education	Quantum Chemistry I	2	Required	4semester	40	1	40	1	20	1																			100
Specialized Education	Quantum Chemistry II	2	Required	5semester	40	1	40	1	20	1																			100
Specialized Education	Advanced Organic Chemistry IV	2	Elective	6semester	40	1	40	1	20	1																			100
Specialized Education	Materials Analysis	2	Elective	6semester	40	1	40	1	20	1																			100
Specialized Education	Chemical Kinetics	2	Elective	5semester	40	1	40	1	20	1																			100
Specialized Education	Organometallic Chemistry	2	Elective	5semester	40	1	40	1	20	1																			100
Specialized Education	Organic Structural Analysis	2	Elective	4semester	40	1	40	1	20	1																			100
Specialized Education	Catalysis Chemistry	2	Elective	6semester	40	1	40	1	20	1																			100
Specialized Education	Synthetic Polymer Chemistry	2	Required	6semester	40	1	40	1	20	1																			100
Specialized Education	Computational Chemistry	2	Elective	5semester	40	1	40	1	20	1																			100
Specialized Education	Electrochemistry	2	Elective	6semester	40	1	40	1	20	1																			100
Specialized Education	Solid State Chemistry	2	Elective	4semester	40	1	40	1	20	1																			100
Specialized Education	Applied Inorganic Chemistry	1	Elective	6semester	40	1	40	1	20	1																			100
Specialized Education	Industrial Polymer Chemistry	2	Elective	6semester	40	1	40	1	20	1																			100
Specialized Education	Bioorganic Chemistry	2	Elective	5semester	40	1	20	1	40	1																			100
Specialized Education	Chemical Engineering Exercise I	2	Elective	4semester	40	1	20	1	40	1																			100
Specialized Education	Chemical Engineering Fundamentals	2	Elective	4semester	40	1	20	1	40	1																			100
Specialized Education	Green Technology	2	Elective	6semester	40	1	20	1	40	1																			100
Specialized Education	Recycling engineering	2	Elective	6semester	40	1	20	1	40	1																			100
Specialized Education	Engineering andndprW (h7 (a)7c9(h)13 8MCID 6766 8DC 0704 0 Tw 3732 0 Td(12 92388 1038005 Tm[E103MC P 8MCID 693 8DC 07045 Tc -0005 2w 49 -0 2 264 c 0789c 0T1(E)1633 (ec)2845 (iqEMC 875 (4i)16i)32d)25r3 (rst)ed8MCID 6766 8DC 07048 Tc -0011 Tw 228 -0 0 228 1144788 1047605 Tm																												

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Curriculum Map of Applied Chemistry