

**Course List and Graduation Requirements for International Programs,
Chemistry Program - School of Engineering (for Undergraduates Enrolled in October 2023)**
(Major: Chemistry and Biotechnology)

Course Category	Course	Term	Credits				Minimum Requirement	
			No of Credits	Compulsory	Compulsory Elective	Elective		
Common Basic Courses	Introduction to Skills for Academic Success	I	1	1			1	
	First Year Seminar	I	2	2			2	
	Language and Culture	Japanese	Fall, Spring	8	8			8
		Japanese/Second Foreign Languages/English	Fall, Spring	6	6			6
	Health and Sports Science	Health and Sports Science: Lecture	I	2			2	2
		Exercise and Sports A	I	1			1	
		Exercise and Sports B	II	1			1	
Data Science	Introduction to Data Science (Lecture)	II	1	1			1	
	Data Science Exercise B	II	1	1			1	
<i>Partial Sum</i>							<i>21</i>	
Liberal Arts and Sciences Courses	Contemporary Liberal Arts (CLA)	Humanities and Social Sciences	Introduction to Cultural Studies ★	Spring	2			2
		Introduction to Political Studies ★	III	2			2	
		Introduction to Economics ★	Spring	2			2	
		Interdisciplinary/Integration of Arts and Sciences	Introduction to Career Development Theory	Fall	2			2
			Art and Culture ★	Spring	2			2
			Gender Studies	III	2			2
			Disaster Prevention and Mitigation	III	2			2
		Global Liberal Arts	Biotechnology	III	2			2
			International Development	IV	2			2
			International Society in the Age of Globalization★	Fall	2			2
	International Studies		IV	2			2	
	Exploration of Japan: From the Outside looking Inside		Spring	2			2	
	Go in Japanese Culture		Fall	2			2	
	Studium Generale A		Fall	2			2	
	Studium Generale B		Spring	2			2	
	Introduction to Intercultural Competence		Fall	2			2	
	Immigration in Japan		IV	2			2	
	Problem/Project Based Learning Seminar	Summer Camp for General Academic Skills	VI	2			2	
	Basic Courses for Specialized Fields (Basic Courses in Natural Sciences)	Calculus I	I	2			2	8
		Calculus II	II	2			2	
Linear Algebra I		I	2			2		
Linear Algebra II		II	2			2		
Complex Analysis		III	2			2	8	
Fundamentals of Physics I		I	2	2				
Fundamentals of Physics II		II	2	2				
Fundamentals of Physics III		II	2	2				
Laboratory in Physics		III	2	2				
Fundamentals of Chemistry I		I	2	2				
Fundamentals of Chemistry II		II	2	2			6	
Laboratory in Chemistry		II	2	2				
Fundamentals of Biology I		I	2	2			4	
Fundamentals of Biology II		II	2	2				
Fundamentals of Earth Science I		I	2			2	2	
Fundamentals of Earth Science II		II	2			2		
Laboratory in Chemistry		II	2			2		
<i>Partial Sum</i>							<i>26</i>	
Sum for Liberal Arts and Sciences Courses							51	
Courses in Specialized Fields	Compulsory Courses ①	Analytical Chemistry	III	2	2		28	
		Organic Chemistry I	III	2	2			
		Physical Chemistry I	III	2	2			
		Physical Chemistry II	IV	2	2			
		Quantum Chemistry I	IV	2	2			
		Inorganic Chemistry II	V	2	2			
		Chemistry of Inorganic Materials I	V	2	2			
		Cell Biology I	III	2	2			
		Inorganic Chemistry I	IV	2	2			
		Organic Chemistry II	IV	2	2			
		Quantum Chemistry II	V	2	2			
		Chemistry and Biotechnology Laboratory 1	VI	3	3			
		Chemistry and Biotechnology Laboratory 2	VI	3	3			
	Elective Courses ②	Mathematics Tutorial I a	I	1			1	16
		Mathematics Tutorial I b	I	1			1	
		Fundamental Physics Tutorial I a	I	1			1	
		Fundamental Physics Tutorial I b	I	1			1	
		Mathematics Tutorial II a	II	1			1	
		Mathematics Tutorial II b	II	1			1	
		Fundamental Physics Tutorial II a	II	1			1	
		Biochemistry I	III	2			2	
		Analytical Mechanics I	III	2			2	
		Mathematical Physics I	III	2			2	
		Mathematical Physics Tutorial I	III	1			1	
		Statistical Physics I	III	2			2	
		Biochemistry II	IV	2			2	
		Cell Biology II	III	2			2	
	Electricity and Magnetism	IV	2			2		
	Organic Chemistry III	V	2			2		
	Earth and Planetary Science	V	2			2		
	Quantum Chemistry III	VI	2			2		
	Earth Environmental Science	VI	2			2		
	Inorganic Chemistry III	VI	2			2		
	Compulsory Courses ③	Chemistry and Biotechnology Laboratory III	VII	3	3		18	
		Chemistry and Biotechnology Laboratory IV	VII	3	3			
		Advanced Chemistry Tutorial A	VII	1	1			
		Graduation Research A	VII	5	5			
		Advanced Chemistry Tutorial B	VIII	1	1			
		Graduation Research B	VIII	5	5			
		Elective Courses ④	Biophysics	IV	2			
	Organic Chemistry V		V	2			2	
	Polymer Chemistry		V	2			2	
	Chemical Physics		V	2			2	
	Organic Chemistry IV		VI	2			2	
	Chemistry of Inorganic Materials II		VI	2			2	
	Computational Chemistry		V	2			2	
	Current Organic and Polymer Chemistry		VI	2			2	
Biochemistry IV	VI		2			2		
Cell Biology IV	VI		2			2		
Elective Courses ⑤	Outline of Engineering III	V	2			2	2	
	View of Advanced Electrical, Electronic and Information Engineering	V	2			2		
	Introduction to Civil Engineering and Architecture	V	2			2		
	International Lectures on Advanced Technology and Trends in Automobile Engineering U1	VI	1			1		
	International Lectures on Advanced Technology and Trends in Automobile Engineering U3	VI	3			3		
Sum for Courses in Specialized Fields							82	
Total Sum							133	

*Confirm the prerequisite for each subject with the syllabus.

★Some of the courses on this column are offered in every other year. Confirm the offering term with the "Liberal Arts and Sciences Class Timetable" of the said year.

**Graduation Requirements for International Programs,
Chemistry Program - School of Engineering (for Undergraduate)**

1. Liberal Arts and Sciences Courses: A combined total of at least 51 credits must be acquired.

(1) Common Basic Courses:

A total of at least 21 credits must be acquired, consisting of 1 credit of Introduction to Skills for Academic Success, 2 credits of First Year Seminar, 14 credits from "Language and Culture", at least 2 credits each of Lecture and Exercise for Health and Sports Science, and 1 credit each of Lecture and Exercise for Data Science.

(2) Liberal Arts Courses:

A total of 4 credits must be acquired, consisting of 2 credits from Contemporary Liberal Arts (Humanities and Social Science and Interdisciplinary/Integration of Arts and Sciences), and 2 credits from Global Liberal Arts Courses or Contemporary Liberal Arts (Humanities and Social Science and Interdisciplinary/Integration of Arts and Sciences) or Problem/Project Based Learning Seminar.

(3) Basic Courses for Specialized Fields(Basic Courses in Natural Sciences):

A total of at least 26 credits must be acquired, consisting a total of at least 8 credits from Calculus I, II, Linear Algebra I, II or Complex Analysis, a total of 8 credits from Fundamentals of Physics I, II, III and Laboratory in Physics, a total of 6 credits from Fundamentals of Chemistry I, II, Laboratory in Chemistry, and a total of 4 credits from Fundamentals of Biology I, II are compulsory.

2. Courses in Specialized Fields: A combined total of at least 82 course credits must be acquired from these course categories.

(1) Compulsory Courses: A total of 46 compulsory course credits must be acquired, consisting of a total of 28 course credits from Compulsory Basic Specialized Courses ① and a total of 18 course credits from Compulsory Specialized Courses ③.

(2) Elective Courses: A total of at least 36 course credits must be acquired, consisting of at least 16 credits from Elective Basic Specialized Courses ②, that of at least 18 course credits from Elective Specialized Courses ④, and that of at least 2 course credits from Elective Related Specialized Courses ⑤.

**Advancement Requirements for International Programs,
Chemistry Program - School of Engineering (for Undergraduate)**

Assesment Year	Course Categories	Minimum Courses/ Credits Required	Requirements	Students unable to advance to the next year
At the End of the Second Grade	Common Basic Courses Liberal Arts Courses Basic Courses for Specialized Fields	40 credits	1.Common Basic Courses Must acquire a total of at least 12"Language and Culture"credits from Japanese, English or Second Foreign Language. *Please note that if you choose Second Foreign Languages for Compulsory Elective(Japanese/ English/ Second Foreign Languages) credits, you must obtain at least 4 credits in each language from German, French, Russian, Chinese, Spanish, or Korean for graduation. 2.Basic Courses in Natural Sciences Must acquire at least 18 credits from Basic Courses in Natural Sciences(*from the courses required for graduation above) .	1. Remain in the second year. 2. Must take no longer than 6 years to complete their second year.[Duration of enrollment (8 years)] minus [third to forth years(2 years)] 3. Students unable to advance to the next year within the 6-year limit stated in 2. above will be expelled from the school.