

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

Course Category		Course	Term	Credits						
				No of Credits	Compulsory	Compulsory Elective	Elective	Minimum Requirement		
Common Basic Courses		Introduction to skills for academic success	Introduction to skills for academic success	I	1	1			1	
		First Year Seminar	First Year Seminar	I	2	2			2	
		Language and Culture	Japanese	Japanese	Fall, Spring	8	8			8
			Japanese/Second Foreign Languages/English	Japanese/Second Foreign Languages/English	Fall, Spring	6	6			6
		Health and Sports Science	Health and Sports Science: Lecture	Health and Sports Science: Lecture	I	2	2			2
			Exercise and Sports A	Exercise and Sports A	I	1	1			2
				Exercise and Sports B	II	1	1			
		Data Science	Introduction to Data Science (Lecture)	Introduction to Data Science (Lecture)	II	1	1			1
			Data Science Exercise B	Data Science Exercise B	II	1	1			1
		<i>Partial Sum</i>					23			23
Liberal Arts and Sciences Courses	Liberal Arts Course	Contemporary Liberal Arts	Humanities and Social sciences	Introduction to Cultural Studies ★	Spring	2			2	
			Introduction to Political Studies ★	III	2			2		
			Introduction to Economics ★	Spring	2			2		
			Introduction to Career Development Theory	Fall	2			2		
			Art and Culture ★	Spring	2			2		
		Interdisciplinary/Integration of arts and sciences	Gender Studies	III	2			2		
			Disaster Prevention and Mitigation	III	2			2		
			Biotechnology	III	2			2		
			International Development	IV	2			2		
			International Society in the Age of Globalization ★	Fall	2			2		
	Global Liberal Arts	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			
		Content courses taught in Japanese	-	-			-			
		Problem/Project Based Learning Seminar	Summer Camp for General Academic Skills	VI	2			2		
		<i>Sum for Liberal Arts and Sciences Courses</i>					23	0	24	47
Basic Courses in Natural Sciences		Calculus I	Calculus I	I	2			2		
		Calculus II	Calculus II	II	2			2		
		Linear Algebra I	Linear Algebra I	I	2			2		
		Linear Algebra II	Linear Algebra II	II	2			2		
		Complex Analysis	Complex Analysis	III	2			2		
		Fundamentals of Physics I	Fundamentals of Physics I	I	2			2		
		Fundamentals of Physics II	Fundamentals of Physics II	II	2			2		
		Fundamentals of Physics III	Fundamentals of Physics III	II	2			2		
		Fundamentals of Chemistry I	Fundamentals of Chemistry I	I	2			2		
		Fundamentals of Chemistry II	Fundamentals of Chemistry II	II	2			2		
		Fundamentals of Biology I	Fundamentals of Biology I	I	2			2		
		Fundamentals of Biology II	Fundamentals of Biology II	II	2			2		
		Fundamentals of Earth Science I	Fundamentals of Earth Science I	I	2			2		
		Fundamentals of Earth Science II	Fundamentals of Earth Science II	II	2			2		
		Laboratory in Physics	Laboratory in Physics	III	2			2		
		Laboratory in Chemistry	Laboratory in Chemistry	II	2			2		
		Laboratory in Biology	Laboratory in Biology	II	2			2		
		<i>Sum for Liberal Arts and Sciences Courses</i>					23	0	24	47
Courses in Specialized Fields	Compulsory Courses ①	Chemistry Seminar I	Chemistry Seminar I	IV	2	2			4	
		Chemistry Seminar II	Chemistry Seminar II	III	2	2				
	Compulsory Elective Courses ②	Analytical Chemistry	Analytical Chemistry	III	2		2		28	
		Inorganic Chemistry I	Inorganic Chemistry I	IV	2		2			
		Inorganic Chemistry II	Inorganic Chemistry II	V	2		2			
		Inorganic Chemistry III	Inorganic Chemistry III	VI	2		2			
		Organic Chemistry I	Organic Chemistry I	III	2		2			
		Organic Chemistry II	Organic Chemistry II	IV	2		2			
		Organic Chemistry III	Organic Chemistry III	V	2		2			
		Physical Chemistry I	Physical Chemistry I	III	2		2			
		Physical Chemistry II	Physical Chemistry II	IV	2		2			
		Quantum Chemistry I	Quantum Chemistry I	IV	2		2			
		Quantum Chemistry II	Quantum Chemistry II	V	2		2			
		Quantum Chemistry III	Quantum Chemistry III	VI	2		2			
		Biochemistry I	Biochemistry I	III	2		2			
		Biochemistry II	Biochemistry II	IV	2		2			
		Chemistry of Inorganic Materials I	Chemistry of Inorganic Materials I	V	2		2			
	Chemistry of Inorganic Materials II	Chemistry of Inorganic Materials II	VI	2		2				
	Mathematical Physics I	Mathematical Physics I	III	2		2				
	Mathematical Physics Tutorial I	Mathematical Physics Tutorial I	III	1		1				
	Elective Courses ③	Mathematics Tutorial Ia	Mathematics Tutorial Ia	I	1			1	8	
		Mathematics Tutorial Ib	Mathematics Tutorial Ib	I	1			1		
		Mathematics Tutorial IIa	Mathematics Tutorial IIa	II	1			1		
		Mathematics Tutorial IIb	Mathematics Tutorial IIb	II	1			1		
		Fundamental Physics Tutorial Ia	Fundamental Physics Tutorial Ia	I	1			1		
		Fundamental Physics Tutorial Ib	Fundamental Physics Tutorial Ib	II	1			1		
		Fundamental Physics Tutorial II	Fundamental Physics Tutorial II	II	1			1		
		Cell Biology I	Cell Biology I	III	2			2		
		Cell Biology II	Cell Biology II	III	2			2		
		Statistical Physics I (Thermodynamics)	Statistical Physics I (Thermodynamics)	III	2			2		
Analytical Mechanics I		Analytical Mechanics I	III	2			2			
Electricity and Magnetism		Electricity and Magnetism	IV	2			2			
Earth and Planetary Science		Earth and Planetary Science	V	2			2			
Environmental Earth Science	Environmental Earth Science	VI	2			2				
<i>Partial Sum</i>					4	28	8	40		
Specialized Courses	Compulsory Courses ④	Chemistry Laboratory	Chemistry Laboratory	V, VI	17	17			37	
		Graduation Research	Graduation Research	VII, VIII	20	20				
	Elective Courses ⑤	Organic Chemistry IV	Organic Chemistry IV	VI	2			2	7	
		Organic Chemistry V	Organic Chemistry V	V	2			2		
		Polymer Chemistry	Polymer Chemistry	V	2			2		
		Computational Chemistry	Computational Chemistry	V	2			2		
		Current Organic and Polymer Chemistry	Current Organic and Polymer Chemistry	VI	2			2		
		Biochemistry IV	Biochemistry IV	VI	2			2		
		Cell Biology IV	Cell Biology IV	VI	2			2		
		Chemical Physics	Chemical Physics	V	2			2		
Biophysics	Biophysics	IV	2			2				
Structural Chemistry	Structural Chemistry	V	2			2				
<i>Partial Sum</i>					37	0	7	44		
Sum for Courses in Specialized Fields					41	28	15	84		
Total Sum					64	28	39	131		

*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 Science (for Undergraduate)**

1. Liberal Arts and Sciences Courses: A combined total of at least 47 credits must be acquired.

(1) Common Basic Courses:

A total of at least 23 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 Contemporary:

A total of at least 4 elective course credits must be acquired, consisting of at least 2 credits from Humanities and Social sciences or Interdisciplinary/Integration of arts and sciences.

(3) Basic Courses in Natural Sciences:

A total of at least 20 credits must be acquired, consisting of 18 course credits from this category of fundamental science courses except three Laboratory courses and at least 2 course credits from the three Laboratory Courses.

2. Courses in Specialized Fields: A combined total of at least 84 course credits must be acquired from these course categories.

(1) Compulsory Courses: A total of 41 compulsory course credits must be acquired, consisting of a total of 37 from Compulsory Specialized Courses ④ and that of 4 compulsory course credits from Compulsory Basic Specialized Courses ①.

(2) Compulsory Elective Courses: A total of at least 28 course credits must be acquired from Compulsory Elective Courses ②.

(3) Elective Courses: A total of at least 15 course credits must be acquired from Elective Courses ③ and ⑤, consisting of a total of at least 8 course credits from Elective Basic Specialized Courses ③ and a total of at least 7 course credits from Elective Specialized Courses ⑤.

(4) If a total of compulsory elective course credits acquired from ② is larger than 28 credits, a maximum of 4 credits out of the exceeding credits can be included in the acquired credits of Elective Specialized Courses ⑤.

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

Time the Judgment is made	Course Categories and Required Number of Credits	Students unable to advance to the next year
At the End of the First Grade	A total of a minimum of 20 course credits must be acquired at the end of the first grade.	1. Remain in the first year. 2. Must take no longer than 5 years to complete their first year. [Duration of enrollment (8 years)] minus [second to forth years(3 years)] 3. Students unable to advance to the next year within the 5-year limit stated in 2. above will be expelled from the school.