Course List and Graduation Requirements for International Programs, Chemistry Program - School of Engineering (for Undergraduates Enrolled in October 2024)

(Major: Chemistry and Biotechnology)

Course Category				Course	Term	Credits				
						No of Credits	Compulsory	Compulsory Elective	Elective	Minimum Requirement
Liberal Arts and Sciences Courses	Common Basic Courses		Introduction to Skills for Academic Success	Introduction to Skills for Academic Success	G- Ⅰ	1	1			1
			First Year Seminar	First Year Seminar	G- 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	G- Ⅰ	2			2	2
				Exercise and Sports A	G- Ⅰ	1			1	
				Exercise and Sports B	G-Ⅱ	1			1	
			Data Science	Introduction to Data Science (Lecture)	G-Ⅱ	1	1			1
				Data Science Exercise B	G-Ⅱ	1	1			1
			Partial Sum							*21*
	Liberal Arts Courses	Global Liberal Arts		International Society in the Age of Globalization ★	Fall	2			2	4 Including of 2 credits from CLA.
				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	
				Special Mathematics Lecture	Fall,Spring	–			–	
				Introduction to Intercultural Competence	Fall	2			2	
				Immigration in Japan	G-Ⅲ	2			2	
				Content courses taught in Japanese (JMI Courses)	–	–			–	
		Contemporary Liberal Arts (CLA)	Humanities and Social Sciences	Introduction to Cultural Studies ★	Spring	2			2	
				Introduction to Political Studies ★	G-Ⅲ	2			2	
				Introduction to Economics ★	G-Ⅳ	2			2	
			Interdisciplinary/Integration of Arts and Sciences	Art and Culture ★	Spring	2			2	
				Introduction to Career Development Theory	Fall	2			2	
				Gender Studies	G-Ⅲ	2			2	
				Disaster Prevention and Mitigation	G-Ⅲ	2			2	
				Biotechnology	Fall	2			2	
		Problem/Project Based Learning Seminar		Summer Camp for General Academic Skills	G-Ⅵ	2			2	
		Basic Courses for Specialized Fields (Basic Courses in Natural Sciences)		Calculus Ⅰ	G- Ⅰ	2			2	8
				Calculus Ⅱ	G-Ⅱ	2			2	
				Linear Algebra Ⅰ	G- Ⅰ	2			2	
				Linear Algebra Ⅱ	G-Ⅱ	2			2	
				Complex Analysis	G-Ⅲ	2			2	
				Fundamentals of Physics Ⅰ	G- Ⅰ	2	2			8
				Fundamentals of Physics Ⅱ	G-Ⅱ	2	2			
				Fundamentals of Physics Ⅲ	G-Ⅱ	2	2			
				Laboratory in Physics	G-Ⅲ	2	2			
				Fundamentals of Chemistry Ⅰ	G- Ⅰ	2	2			6
				Fundamentals of Chemistry Ⅱ	G-Ⅱ	2	2			
				Laboratory in Chemistry	G-Ⅱ	2	2			
				Fundamentals of Biology Ⅰ	G- Ⅰ	2	2			4
				Fundamentals of Biology Ⅱ	G-Ⅱ	2	2			
				Partial Sum						*26*
	Sum for Liberal Arts and Sciences Courses									**51**
Courses in Specialized Fields	Basic Specialized Courses		Compulsory Courses ①	Analytical Chemistry	G-Ⅲ	2	2			28
				Organic Chemistry Ⅰ	G-Ⅲ	2	2			
				Physical Chemistry Ⅰ	G-Ⅲ	2	2			
				Physical Chemistry Ⅱ	G-Ⅳ	2	2			
				Quantum Chemistry Ⅰ	G-Ⅳ	2	2			
				Inorganic Chemistry Ⅱ	G-Ⅴ	2	2			
				Chemistry of Inorganic Materials Ⅰ	G-Ⅴ	2	2			
				Cell Biology Ⅰ	G-Ⅲ	2	2			
				Inorganic Chemistry Ⅰ	G-Ⅳ	2	2			
				Organic Chemistry Ⅱ	G-Ⅳ	2	2			
				Quantum Chemistry Ⅱ	G-Ⅴ	2	2			
				Chemistry and Biotechnology Laboratory 1	G-Ⅵ	3	3			
				Chemistry and Biotechnology Laboratory 2	G-Ⅵ	3	3			
			Elective Courses ②	Mathematics Tutorial Ⅰ a	G- Ⅰ	1			1	16
				Mathematics Tutorial Ⅰ b	G- Ⅰ	1			1	
				Fundamental Physics Tutorial Ⅰ a	G- Ⅰ	1			1	
				Fundamental Physics Tutorial Ⅰ b	G- Ⅰ	1			1	
				Mathematics Tutorial Ⅱ a	G-Ⅱ	1			1	
				Mathematics Tutorial Ⅱ b	G-Ⅱ	1			1	
				Fundamental Physics Tutorial Ⅱ	G-Ⅱ	1			1	
				Biochemistry Ⅰ	G-Ⅲ	2			2	
				Analytical Mechanics Ⅰ	G-Ⅲ	2			2	
				Mathematical Physics Ⅰ	G-Ⅲ	2			2	
				Mathematical Physics Tutorial Ⅰ	G-Ⅲ	1			1	
				Statistical Physics Ⅰ	G-Ⅲ	2			2	
				Biochemistry Ⅱ	G-Ⅳ	2			2	
				Cell Biology Ⅱ	G-Ⅲ	2			2	
				Electricity and Magnetism	G-Ⅳ	2			2	
				Organic Chemistry Ⅲ	G-Ⅴ	2			2	
				Earth and Planetary Science	G-Ⅴ	2			2	
				Quantum Chemistry Ⅲ	G-Ⅵ	2			2	
				Earth Environmental Science	G-Ⅵ	2			2	
				Inorganic Chemistry Ⅲ	G-Ⅵ	2			2	
	Specialized Courses		Compulsory Courses ③	Chemistry and Biotechnology Laboratory Ⅲ	G-Ⅶ	3	3			18
				Chemistry and Biotechnology Laboratory Ⅳ	G-Ⅶ	3	3			
				Advanced Chemistry Tutorial A	G-Ⅶ	1	1			
				Graduation Research A	G-Ⅶ	5	5			
				Advanced Chemistry Tutorial B	G-Ⅷ	1	1			
				Graduation Research B	G-Ⅷ	5	5			
			Elective Courses ④	Biophysics	G-Ⅳ	2			2	18
				Organic Chemistry Ⅴ	G-Ⅴ	2			2	
				Polymer Chemistry	G-Ⅴ	2			2	
				Chemical Physics	G-Ⅴ	2			2	
				Organic Chemistry Ⅳ	G-Ⅵ	2			2	
				Chemistry of Inorganic Materials Ⅱ	G-Ⅵ	2			2	
				Computational Chemistry	G-Ⅴ	2			2	
				Current Organic and Polymer Chemistry	G-Ⅵ	2			2	
				Biochemistry Ⅳ	G-Ⅵ	2			2	
				Cell Biology Ⅳ	G-Ⅵ	2			2	
	Related Specialized Courses		Elective Courses ⑤	Outline of Engineering Ⅲ	G-Ⅴ	2			2	2
				View of Advanced Electrical, Electronic and Information Engineering	G-Ⅴ	2			2	
				Introduction to Civil Engineering and Architecture	G-Ⅴ	2			2	
				International Lectures on Advanced Technology and Trends in Automobile Engineering U1	G-Ⅵ	1			1	
				International Lectures on Advanced Technology and Trends in Automobile Engineering U3	G-Ⅵ	3			3	
	Sum for Courses in Specialized Fields						46	0	36	**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.

＊Please note that the terms and courses in Liberal Arts Courses may change for various reasons.
For the latest information, make sure to check the timetables (Timetable A and Timetable B) of the relevant term.

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	Commom Basic Courses Liberal Arts Courses Basic Courses for Specialized Fields	40 credits	1.Commom 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.