

**Course List and Graduation Requirements for International Programs,
Fundamental and Applied Physics Program – School of Engineering(for Undergraduates Enrolled in October 2018)**
(Major: Physical Science and Engineering)

Course Category □	Course	* Notes (offer Academic Year)	Term	Credits					
				No of Credits	Compulsory	Compulsory Elective	Elective	Minimum Requirement	
Basic General Education Courses	First Year Seminar		First Year Seminar A	I	2	2			2
	Language and Culture		Japanese/Languages except English	I, II	12	12			12
	Health and Sports Science		Health and Sports Science: Lecture	I	2			2	2
			Health and Sports Science: Practicum I	II	1			1	
	Health and Sports Science: Practicum II		III	1			1		
*2 Basic Courses in Humanities and Social Sciences	History	*1 AY2020	TBD	2			2	4	
	Literature	*1	II	2			2		
	Comparative Studies of Cultures	*1	I	2			2		
	Introduction to Cultural Studies	*1 AY2020	TBD	2			2		
*2 Liberal Education Courses in Humanities and Social Sciences	Culture and Representation	*1 AY2020	TBD	2			2	4	
	Past and Present of Democracy	*1	I	2			2		
	International Society of Globalization Age	*1 AY2019	I	2			2		
Liberal Education Courses in Natural Sciences	Biotechnology		I	2			2	4	
	Modern Biology		II	2			2		
	Science of Materials		III	2			2		
*2 Liberal Education Courses in Interdisciplinary Fields	Exploration of Japan: From the Outside Looking Inside		II	2			2	2	
	Introduction to Career Development Theory		I	2			2		
	Preparedness for Imminent Natural Disasters		III	2			2		
	Thinking about Japanese Society in the 21st Century from Gender Perspectives		I	2			2		
	Special Lecture (Studium Generale)		I・II	2			2		
	Special Lecture (Go in Japanese Culture)		III	2			2		
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		
	Fundamentals of Physics I		I	2	2			8	
	Fundamentals of Physics II		I	2	2				
	Fundamentals of Physics III		II	2	2				
	Fundamentals of Physics IV		II	2	2			4	
	Fundamentals of Chemistry I		I	2	2				
	Fundamentals of Chemistry II		II	2	2			4	
	Fundamentals of Biology I		I	2			2		
	Fundamentals of Biology II		II	2			2	4	
	Fundamentals of Earth Science I		I	2			2		
	Fundamentals of Earth Science II		II	2			2		
	Laboratory in Physics		III	1.5	1.5			1.5	
	Laboratory in Chemistry		II	1.5	1.5			1.5	
Laboratory in Biology		II	1.5			1.5			
Sum for Liberal Arts and Sciences Courses						29		20	49
Basic Specialized Courses	Compulsory Courses ①		Fundamental Physics Tutorial II a	II	1	1			26
			Fundamental Physics Tutorial II b	II	1	1			
			Mathematics I and Tutorial	III	4	4			
			Mathematics II and Tutorial	III	4	4			
			Analytical Mechanics I	III	2	2			
			Statistical Physics I	III	2	2			
			Physics Tutorial I a	III	0.5	0.5			
			Physics Tutorial I b	III	0.5	0.5			
			Electricity and Magnetism	IV	2	2			
			Quantum Mechanics I	IV	2	2			
			Applied Physics Laboratory I	IV	1	1			
			Statistical Physics II	V	2	2			
			Applied Physics Tutorial II a	V	1	1			
			Applied Physics Tutorial II b	V	1	1			
		Applied Physics Tutorial III a	IV	1	1				
		Applied Physics Tutorial III b	IV	1	1				
	Elective Courses ②		Mathematics Tutorial I a	I	1			1	4
			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		
		Fundamentals of Biology II	II	2			2		
		Analytical Mechanics II	IV	2			2		
Partial Sum						26	0	10	30
Courses in Specialized Fields	Compulsory Courses ③		Computer Software II	II	2	2			35
			Mechanics of Continuous Media	IV	2	2			
			Quantum Mechanics II	V	2	2			
			Applied Physics Laboratory II	V	1.5	1.5			
			Condensed Matter Physics I	V	2	2			
			Computational Chemistry	V	2	2			
			Optics	VI	2	2			
			Statistical Physics III	VI	2	2			
			Applied Physics Tutorial IV a	VI	1	1			
			Applied Physics Tutorial IV b	VI	1	1			
			Applied Physics Laboratory III	VI	1.5	1.5			
			Condensed Matter Physics II	VI	2	2			
			Applied Physics Tutorial V a	VII	1	1			
			Applied Physics Tutorial V b	VII	1	1			
		Condensed Matter Physics III	VII	2	2				
		Graduation Research A	VII	5	5				
		Graduation Research B	VIII	5	5				
	Compulsory Elective Courses ④		Computer Software I	I	2		2		12
			Biophysics	IV	2		2		
			Fluid Mechanics and Tutorial	IV	2.5		2.5		
		Chemical Physics	V	2		2			
		Fluid Mechanics	V	2		2			
		Applied Physics Seminar	VI	2		2			
Elective Courses ⑤		Physical Chemistry I	III	2			2	4	
		Astrophysics	IV	2			2		
		Scientific Measurements	V	2			2		
		Particle Physics	V	2			2		
		Earth and Planetary Science	V	2			2		
Related Specialized Courses	Elective Courses ⑥		Outline of Engineering III	VII	2		2	4	
			View of Advanced Electrical, Electronic and Information Engineering	VII	2		2		
			Introduction to Civil Engineering and Architecture	VII	2		2		
			Introduction to Chemical and Biological Industries	VIII	2		2		
			Introduction to Physical Science and Engineering	VI	2		2		
Sum for Courses in Specialized Fields						61	12	12	85
Total Sum						90	12	32	134

(Important) Please confirm the prerequisite for each subject with syllabus.

*1 Some of the courses on this column are offered in every other year. Please confirm the offering term with the "Liberal Arts and Sciences Class Please refer to the detail of the Term on the page 1 of 'Student Handbook'.

*2 Offering term of the courses in this column may be subject to change.

**Graduation Requirements for International Programs,
Fundamental and Applied Physics Program – School of Engineering (for Undergraduate)**

- 1. Liberal Arts and Sciences Courses: A combined total of at least 49 credits must be acquired.**
- (1) Basic General Education Courses: A total of at least 16 credits must be acquired, consisting of 2 credits from first year seminar A, 12 credits from Japanese/ Languages except English, and at least 2 credits from Health and Sports Science Courses.
- (2) Basic Courses in Humanities and Social Sciences and Liberal Education Courses in Humanities and Social Sciences: A total of at least 4 course credits must be acquired from these two Courses Categories.
- (3) Liberal Education Courses in Natural Sciences: A total of at least 4 elective course credits must be acquired.
- (4) Liberal Education Courses in Interdisciplinary Fields: At least 2 elective course credits must be acquired.
- (5) Basic Courses in Natural Sciences: A total of at least 23 credits must be acquired, consisting of a total of at least 8 elective course credits from 5 Fundamental Mathematics courses, a total of 8 compulsory course credits from 4 Fundamentals of Physics, 4 compulsory course credits from Fundamentals of Chemistry I and II, 1.5 course credits of Laboratory in Physics, and 1.5 course credits of Laboratory in Chemistry.
- 2. Courses in Specialized Fields: A combined total of at least 85 course credits must be acquired from these course categories.**
- (1) Compulsory Courses: A total of 26 course credits must be acquired from Compulsory Basic Specialized Courses ①, and a total of 35 course credits must be acquired from Compulsory Specialized Courses ③.
- (2) Compulsory Elective courses: A total of at least 12 course credits must be acquired from Compulsory Elective courses ④.
- (3) Elective Courses: A total of at least 12 course credits must be acquired, consisting of at least 4 course credits from Elective Basic Specialized Courses ②, that of at least 4 credits from Elective Specialized Courses ⑤, and that of at least 4 course credits from Elective Related Specialized Courses ⑥.

**Requirements for Advancement for International Programs,
Fundamental and Applied Physics Program – School of Engineering (for Undergraduate)**

Time When Judgment is Made	Course Categories	A Minimum Number of Required Credits/ Courses	Details
At the End of the First Grade	Basic Courses in Natural Sciences	5 Courses	A minimum of 5 courses from the Basic Courses in Natural Sciences must be acquired.
At the End of the Second Grade	Basic General Education Courses, Basic Courses in Humanities and Social Sciences, Liberal Education Courses in Humanities and Social Sciences, Basic Courses in Natural Sciences, Liberal Education Courses in Natural Sciences, Liberal Education Courses in Interdisciplinary Fields	41 credits	<p>1. Basic General Education Courses: A total of at least 10.5 course credits must be acquired from the Language and Culture Courses: Japanese, German, French, Russian, Chinese, Spanish, or Korean</p> <p>2. Basic Courses in Natural Sciences: A total of at least 17.5 course credits must be acquired from Basic Courses in Natural Sciences, including 1.5 credits of Laboratory in Physics.</p>