

# Educational curriculum (for students enrolled in FY 2019)

## Interdepartmental Subjects

Subjects	Credits	Semester FH: First Half LH: Latter Half	Hours per week			Eligible Students	Teacher- training course	Inter- Graduate School Classes	Remarks	Completion Requirements
			Lecture	Seminar	Experiment Practice					
<b>Master's and Doctoral Courses</b>										
(Elective Subjects)										
International Science Initiative	1	Semester 1	2			MC1~2	TTC	○		
Special Lecture I	1	(indetermination)	1			MC · DC				
Special Lecture II	2	(indetermination)	2			MC · DC				
Special Seminar I	1	(indetermination)		1		MC · DC				
Special Seminar II	2	(indetermination)		2		MC · DC				
Special Practice I	1	(indetermination)			2	MC · DC				
Special Practice II	2	(indetermination)			4	MC · DC				
Science Globe- Outbound I	1	Full Year			2	MC · DC				
Science Globe- Outbound II	2	Full Year			4	MC · DC				

Note:

1. "Math" and "Sci." in the Teacher-training course column in each list indicate subjects in Math and Science, respectively, and TTC indicates subjects pertaining to teacher training. Students who apply for a specialized teaching certificate (junior high school and/or high school) **must first fulfill the basic requirements for the First Class Teacher Certificate** (the requirements will vary according to teaching subject and school category), and shall additionally take 24 or more credits in total from the Teacher-training course.

2. Students may take the same subject multiple times if it is held in different contexts.

3. Check the schedule by syllabus and bulletin board as the semester in which these subjects are provided may change.

4. Subjects classified under Inter-Graduate School Classes are subject to change every academic year. Check the latest "Student Handbook".

5. Subjects whose semesters are listed as indetermination or intensive will be announced by Rigaku Joho System and bulletin board as soon as fixed.

6. Semester's names indicated in the Semester column correspond to the terms described below.

※Depending on the fiscal year, semester's starting/ending month may change. Check the annual event schedule, etc.

- Semester 1 FH: Spring term April~May
- Semester 1 LH: Summer term June~July
- Semester 2 FH: Fall term October~November
- Semester 2 LH: Winter term After December

## Department of Mathematics

Subjects	Credits	Semester FH: First Half LH: Latter Half	Hours per week			Eligible Students	Teacher- training course	Inter- Graduate School Classes	Remarks	Completion Requirements
			Lecture	Seminar	Experiment Practice					
<b>Master's Course</b>										
(Compulsory Subjects)										
Research in Mathematics	10	Full Year		5		MC1-2	Math		<b>Completion Requirements for the Master's Course</b> Take at least 30 credits, including 10 from Compulsory Subjects and 20 or more from Primary Elective Subjects and Secondary Elective Subjects.  Credits from Secondary Elective Subjects may include credits from: -Interdepartmental Subjects -Inter-Graduate School Classes -Subjects from other departments and graduate schools	
(Primary Elective Subjects)										
Overview of Modern Mathematics	1	Semester 1 & 2	2			MC1-2	Math	○		
Overview of Mathematical Sciences	1	Semester 1 & 2	2			MC1-2	Math	○		
Basic Studies on Mathematics I	2	Semester 1		2		MC1	Math			
Basic Studies on Mathematics II	2	Semester 2		2		MC1	Math			
Basic Studies on Mathematics III	2	Semester 1		2		MC2	Math			
Basic Studies on Mathematics IV	2	Semester 2		2		MC2	Math			
Basic Group Study in Mathematics	1	Semester 1		1		MC1	Math			
Interactive Group Study in Mathematics	1	Semester 2		1		MC1-2	Math			
Autonomous Group Study in Mathematics I	2	Semester 1		2		MC1-2	Math			
Autonomous Group study in Mathematics II	2	Semester 2		2		MC1-2	Math			
(Secondary Elective Subjects)										
Algebra	2	Semester 1 & 2	2			MC1-2	Math			
Topics in Algebra A	1	Semester 1 & 2	2			MC1-2	Math	○		
Topics in Algebra B	1	Semester 1 & 2	2			MC1-2	Math	○		
Geometry	2	Semester 1 & 2	2			MC1-2	Math			
Topics in Geometry A	1	Semester 1 & 2	2			MC1-2	Math	○		
Topics in Geometry B	1	Semester 1 & 2	2			MC1-2	Math	○		
Analytic Studies	2	Semester 1 & 2	2			MC1-2	Math			
Topics in Mathematical Analysis A	1	Semester 1 & 2	2			MC1-2	Math	○		
Topics in Mathematical Analysis B	1	Semester 1 & 2	2			MC1-2	Math	○		
Special Lecture on Algebra	1	(Intensive)	1			MC1-2	Math			
Special Lecture on Geometry	1	(Intensive)	1			MC1-2	Math			
Special Lecture on Analytic Studies	1	(Intensive)	1			MC1-2	Math			
<b>Doctoral Course</b>										
(Tertiary Elective Subjects)										
Special Researches in Mathematics	12	Full Year		6		DC1-3	—		<b>Completion Requirements for the Doctoral Course:</b> Take at least 30 credits, including credits from a Master's Course. For exceptions, refer to the Hokkaido University Graduate School of Science Regulations.	

Note:

- Students may take the same subject multiple times if it is held in different contexts.
- Check the schedule by syllabus and bulletin board as the semester in which these subjects are provided may change.
- Subjects classified under Inter-Graduate School Classes are subject to change every academic year. Check the latest "Student Handbook".
- Subjects whose semesters are listed as indetermination or intensive will be announced by Rigaku Joho System and bulletin board as soon as fixed.
- Semester's names indicated in the Semester column correspond to the terms described below.

※Depending on the fiscal year, semester's starting/ending month may change. Check the annual event schedule, etc.

- Semester 1 FH: Spring term April~May
- Semester 1 LH: Summer term June~July
- Semester 2 FH: Fall term October~November
- Semester 2 LH: Winter term After December

## Department of Condensed Matter Physics

Subjects	Credits	Semester FH: First Half LH: Latter Half	Hours per week			Eligible Students	Teacher- training course	Inter- Graduate School Classes	Remarks	Completion Requirements	
			Lecture	Seminar	Experiment Practice						
<b>Master's Course</b>											
(Compulsory Subjects)											
Senior Seminar in Physics	4	Full Year		2		MC1-2	Sci.			<b>Completion Requirements for the Master's Course</b> Take at least 30 credits, including 12 from Compulsory Subjects and 18 or more from Elective Subjects. Credits from Elective Subjects may include credits from: -Interdepartmental Subjects -Inter-Graduate School Classes -Subjects from other departments and graduate schools	
Research in Condensed Matter Physics 1	8	Full Year			8	MC1-2	Sci.				
(Elective Subjects)											
Introduction to Modern Physics	1	Semester 1, FH	2			MC1-2	Sci.	○			
Statistical Physics	2	Semester 1or 2	2			MC1-2	Sci.				
Computational Physics	2	Semester 1or 2	2			MC1-2	Sci.				
Field Theory in Statistical Mechanics	2	Semester 1or 2	2			MC1-2	Sci.				
Physics of Dielectrics	2	Semester 1or 2	2			MC1-2	Sci.				
Quantum Optical Physics	2	Semester 1or 2	2			MC1-2	Sci.				
Semiconductor Physics	2	Semester 1or 2	2			MC1-2	Sci.				
Electronic Properties of Solids	2	Semester 1or 2	2			MC1-2	Sci.				
Superconductivity	2	Semester 1or 2	2			MC1-2	Sci.				
Low Temperature Physics	2	Semester 1or 2	2			MC1-2	Sci.				
Magnetism	2	Semester 1or 2	2			MC1-2	Sci.				
Surface and Thin-film Magnetism	2	Semester 1or 2	2			MC1-2	Sci.				
Physics of Quantum Device	2	Semester 1or 2	2			MC1-2	Sci.				
Complex Matter Physics	2	Semester 1or 2	2			MC1-2	Sci.				
Special Lecture on Condensed Matter Physics 1	1	(Non-regular)	1			MC1-2	Sci.				
Special Lecture on Condensed Matter Physics 2	1	(Non-regular)	1			MC1-2	Sci.				
<b>Doctoral Course</b>											
(Elective Subjects)											
Research in Condensed Matter Physics 2	12	Full Year			12	DC1-3	--				
Research and Seminar in Condensed Matter Physics A	3	Semester 1, FH			12	DC1-3	--				
Research and Seminar in Condensed Matter Physics B	3	Semester 1, LH			12	DC1-3	--				
Research and Seminar in Condensed Matter Physics C	3	Semester 2, FH			12	DC1-3	--				
Research and Seminar in Condensed Matter Physics D	3	Semester 2, LH			12	DC1-3	--				

**Note**

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2. Check the schedule by syllabus and bulletin board as the semester in which these subjects are provided may change.
3. Subjects classified under Inter-Graduate School Classes are subject to change every academic year. Check the latest "Student Handbook".
4. Subjects whose semesters are listed as indetermination or intensive will be announced by Rigaku Joho System and bulletin board as soon as fixed.
5. Semester's names indicated in the Semester column correspond to the terms described below.

※Depending on the fiscal year, semester's starting/ending month may change. Check the annual event schedule, etc.

- Semester 1 FH: Spring term    April~May
- Semester 1 LH: Summer term    June~July
- Semester 2 FH: Fall term    October~November
- Semester 2 LH: Winter term    After December

## Department of CosmoSciences

Subjects	Credits	Semester FH: First Half LH: Latter Half	Hours per week			Eligible Students	Teacher- training course	Inter- Graduate School Classes	Remarks	Completion Requirements	
			Lecture	Seminar	Experiment Practice						
<b>Master's Course</b>											
(Compulsory Subjects)											
Seminar of CosmoSciences	2	Full Year		1		MC1-2	Sci.			<b>Completion Requirements for the Master's Course</b> Take at least 30 credits, including 12 from Compulsory Subjects and 18 or more from Elective Subjects. Credits from Elective Subjects may include credits from : -Interdepartmental Subjects -Inter-Graduate School Classes -Subjects from other departments and graduate schools	
Seminar of CosmoSciences	2	Full Year		1		MC1-2	Sci.				
Special Research of CosmoSciences 1	8	Full Year			8	MC1-2	Sci.				
(Elective Subjects)											
Introduction to CosmoSciences	1	Semester 2, FH	2			MC1-2	Sci.	○			
Theory of Fields 1	2	Semester 1	2			MC1-2	Sci.				
Theory of Fields 2	2	Semester 2	2			MC1-2	Sci.				
Elementary Particle Physics	2	Semester 2	2			MC1-2	Sci.				
Nuclear Physics 1	2	Semester 1	2			MC1-2	Sci.				
Nuclear Physics 2	2	Semester 2	2			MC1-2	Sci.				
Astrophysics 1	2	Semester 1	2			MC1-2	Sci.				
Astrophysics 2	2	Semester 2	2			MC1-2	Sci.				
Advanced Course on Material Evolution 1	2	Semester 1	2			MC1-2	Sci.				
Advanced Course on Material Evolution 2	2	Semester 2	2			MC1-2	Sci.				
Advanced Course on Planetary Systems 1	2	Semester 1	2			MC1-2	Sci.				
Advanced Course on Planetary Systems 2	2	Semester 2	2			MC1-2	Sci.				
Planetary Atmospheric Sciences 1	2	Semester 1	2			MC1-2	Sci.				
Planetary Atmospheric Sciences 2	2	Semester 2	2			MC1-2	Sci.				
Advanced Course in Phase Transition of Planetary Materials	2	Semester 1	2			MC1-2	Sci.				
Advanced Course in Planetary Material Science	2	Semester 2	2			MC1-2	Sci.				
Special Lecture of CosmoSciences 1	1	(Intensive)	1			MC1-2	Sci.				
Special Lecture of CosmoSciences 2	1	(Intensive)	1			MC1-2	Sci.				
<b>Doctoral Course</b>											
(Elective Subjects)											
Special Research of CosmoSciences 2	12	Full Year			12	DC1-3	—			<b>Completion Requirements for the Doctoral Course</b> Take at least 30 credits, including credits from a Master's Course. For exceptions, refer to the Hokkaido University Graduate School of Science Regulations.	

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  - ※Depending on the fiscal year, semester's starting/ending month may change. Check the annual event schedule, etc.
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  - Semester 1 LH: Summer term    June~July
  - Semester 2 FH: Fall term    October~November
  - Semester 2 LH: Winter term    After December

## Department of Natural History Sciences

Subjects	Credits	Semester FH: First Half LH: Latter Half	Hours per week			Eligible Students	Teacher- training course	Inter- Graduate School Classes	Remarks	Completion Requirements
			Lecture	Seminar	Experiment Practice					
<b>Master's Course</b>										
<b>(Compulsory Subjects)</b>										
Seminar in Natural History Science 1	4	Full Year		2		MC1-2	Sci.			<b>Completion Requirements for Master's Course</b> Take at least 30 credits, including 12 from Compulsory Subjects and 18 or more from Primary Elective Subjects. Credits from Primary Elective Subjects may include credits from: -Interdepartmental Subjects -Inter-Graduate School Classes -Subjects from other departments and other graduate schools  Take at least 4 or more credits from Inter-Graduate School Classes among Primary Elective Subjects
Research in Natural History Science 1	8	Full Year			8	MC1-2	Sci.			
<b>(Primary Elective Subjects)</b>										
Introduction to Earth and Planetary System Science	1	Semester 2, FH	2			MC1-2	Sci.	○		
Introduction to Magma Science	1	Semester 1, FH	2			MC1-2	Sci.			
Advanced Magma Science	1	Semester 1, LH	2			MC1-2	Sci.			
Advanced Geochemistry	2	Semester 1	2			MC1-2	Sci.			
Introduction to Earth & Planetary Materials	1	Semester 2, FH	2			MC1-2	Sci.			
Advanced Earth & Planetary Materials	1	Semester 2, LH	2			MC1-2	Sci.			
Introduction to Organic Geochemistry	1	Semester 1, FH	2			MC1-2	Sci.			
Advanced Organic Geochemistry	1	(Intensive)	2			MC1-2	Sci.			
Introduction to Geotectonics in Mobile Belts	1	Semester 2, FH	2			MC1-2	Sci.	○		
Advanced Geotectonics in Mobile Belts	1	Semester 2, LH	2			MC1-2	Sci.			
Advanced Seismology	2	Semester 2	2			MC1-2	Sci.			
Introduction to Earth Environmental History	1	(Intensive)	2			MC1-2	Sci.	○		
Advanced Earth Environmental History	1	Semester 2, LH	2			MC1-2	Sci.			
Internal Structure of the Earth	2	Semester 1	2			MC1-2	Sci.			
Advanced Crustal Dynamics	2	Semester 1	2			MC1-2	Sci.			
Introductory Satellite Geodesy	1	Semester 2, FH	2			MC1-2	Sci.	○		
Advanced Satellite Geodesy	1	Semester 2, LH	2			MC1-2	Sci.			
Applied Metrology to Seismology and Volcanology	2	Semester 2	2			MC1-2	Sci.			
Advanced Subsurface Exploration	2	Semester 2	2			MC1-2	Sci.			
Advanced Atmospheric Science	2	Semester 2	2			MC1-2	Sci.			
Advanced Physical Oceanography and Climatology	2	Semester 1	2			MC1-2	Sci.			
Prognosis of Earthquakes and Volcanic Eruptions	2	Semester 1	2			MC1-2	Sci.			
Introduction to Biodiversity Study	1	Semester 2, FH	2			MC1-2	Sci.	○		
Advanced Biodiversity Study I	2	Semester 1	2			MC1-2	Sci.			
Advanced Biodiversity Study II	2	Semester 2	2			MC1-2	Sci.			
Biodiversity	2	Semester 2, LH	4			MC1-2	Sci.			
Methods in Biodiversity Studies	2	Semester 1	2			MC1-2	Sci.			
Taxonomy	2	Semester 1	2			MC1-2	Sci.			
Evolutionary Biology	2	Semester 2	2			MC1-2	Sci.	○	Only some of the subjects	
Advanced Course of Science Technology and Social System I	1	Semester 1, FH	2			MC1-2	TTC			
Advanced Course of Science Technology and Social System II	1	Semester 1, LH	2			MC1-2	TTC			
Communication in Science and Technology I	1	Semester 1, FH	2			MC1-2	TTC	○		
Communication in Science and Technology II	1	Semester 1, LH	2			MC1-2	TTC	○		
Communication in Science and Technology III	2	Semester 2	2			MC1-2	TTC			
Museum Communication	2	Semester 1 & 2		2		MC1-2	TTC	○		
History of Science and Technology	2	Semester 1	2			MC1-2	TTC			
Foundational Philosophy of Science and Technology	2	Semester 2	2			MC1-2	TTC			
Special Lecture on Design for Teaching and Learning of Science Education	2	Semester 1	2			MC1-2	TTC			
Social Construction for Science and Technology I	1	Semester 1, FH	2			MC1-2	TTC	○		
Social Construction for Science and Technology II	1	Semester 1, LH	2			MC1-2	TTC			
Special Lecture on Management for Science Education	2	Semester 2	2			MC1-2	TTC			
Special Lecture on Natural History Science I	1	(Intensive)	1			MC1-2	Sci.			
Special Lecture on Natural History Science II	1	(Intensive)	1			MC1-2	Sci.			
Special Lecture on Natural History Science III	1	(Intensive)	1			MC1-2	Sci.			
Special Lecture on Natural History Science IV	1	(Intensive)	1			MC1-2	Sci.			
<b>Doctoral Courses</b>										
<b>(Secondary Elective Subjects)</b>										
Seminar in Natural History Sciences 2	6	Full Year		3		DC1-3	--			<b>Completion Requirements for the Doctoral Course</b> Take at least 30 credits, including credits from a Master's Course. For exceptions, refer to the Hokkaido University Graduate School of Science Regulations.
Research in Natural History Sciences 2	12	Full Year			12	DC1-3	--			

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- Semester 1 LH: Summer term June~July
- Semester 2 FH: Fall term October~November
- Semester 2 LH: Winter term After December

### Recommended Subjects of Department of Natural History Sciences (Inter-Graduate School Classes)

Subjects	Credits	Semester FH: First Half LH: Latter Half	Hours per week			Eligible Students	Teacher-training course	Inter-Graduate School Classes	Remarks	Completion Requirements
			Lecture	Seminar	Experiment/Practice					
Inter-Graduate School Classes(General Subject):Natural and Applied Sciences-Neo-Science of Natural History	2	Semester 1	2			MC1-2	--	○		

### Recommended Subjects of Department of Natural History Sciences (held at the Graduate School of Env. Sci.)

Subjects	Credits	Semester FH: First Half LH: Latter Half	Hours per week			Eligible Students	Teacher-training course	Inter-Graduate School Classes	Remarks	Completion Requirements
			Lecture	Seminar	Experiment/Practice					
Fundamental Lecture in Biological Diversity	2	Semester 2, FH	4			MC1-2	--	○		

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