For entrants in AY 2021

Appended Form 1

Specifications for Major Program

Name of School (Program) [School of Science (Department of Mathematics)

Program name (Japanese)	X Û É ß ¢ Û Ò
(English)	Mathematics

1. Degree to be obtained: Bachelor of Science

2. Overview

Among the fields of science, mathematics is the subject in which standardization and systematization are the most advanced. The Mathematics Program at Hiroshima University mainly aims to educate students to understand and rigorously learn the essence of basic theories in the fields of modern mathematics such as algebra, geometry, and analysis. Through this process, students develop an in-depth ability to comprehend complex phenomena from a mathematical point of view in order to generalize, abstract, systematize, and model these phenomena. Students are also enabled to improve their abilities in logical thinking and representation in order to establish a foundation for their future. The abilities described above are required for identifying, formulating, and solving the various problems that appear in all areas of society. We also aim to educate students through carefully supervised independent study in order to produce professionals who are capable of making autonomous decisions based on concrete evidence and able to work in various fields while adapting to change and newly-emerging factors. We hope to create researchers who will contribute to the evolution of mathematical science in the future, educators who understand the essence and academic meaning of modern science, and professionals who have sophisticated mathematical thinking abilities and the creativity required to meet the needs of an information-intensive society. Mastery of basic academic skills and advanced knowledge is expected upon completion of the course.

A great deal of importance will be attached to the continuity of education from the undergraduate to the graduate school. Students can advance to the Mathematics Program in the Division of Advanced Science and Engineering in the Graduate School of Advanced Science and Engineering or to the Program of Mathematical and Life Sciences in the Division of Integrated Sciences for Life in the Graduate School of Integrated Sciences for Life.

Subjects are arranged clearly and hierarchically in liberal arts subjects and specialized education subjects (specialized basic subjects and specialized subjects). Globally standardized lessons are provided for specialized basic subjects and specialized subjects in which lectures are supported by exercise sessions. Therefore, achievement in this program is considered to be an achievement of the global standard. In the 3rd year, lessons that enable students to acquire the knowledge and skills required for exploring cutting edge of the field that they have chosen will be provided. Because of these lessons, students will be able comprehend and enjoy specialized lectures in the Department of Mathematics and benefit from a bachelor's course in which a great deal of importance is given to the continuity of education from the undergraduate school to the graduate school.

Since Mathematics is a common language in the fields of natural science, this program gives consideration to the

fact that students may advance to various fields in science after obtaining their mathematics degree. Specializ
fundamental subjects from other programs in the School of Science are accepted as part of the credit required for
graduation.

This program also provides courses to meet the requirements of students who wish to obtain certification a
Mathematics teachers for junior and senior high schools. Furthermore, students who obtain a master's degree are
permitted to obtain specialized certification for Mathematics teachers of junior and senior high schools.

3. Diploma policy (policy for awarding degrees and goal of the program)

Based on the aims above, this program will award the degree of Bachelor of Science to students who, in addition
earning the required number of credits, have acquired the capabilities described below:

- The ability to think and make decisions from a wide-ranging perspective
- The ability to understand the essence of basic theories in the various fields of modern mathematics and how
  apply those theories
- The ability to think and express oneself logically
- The ability to comprehend various phenomena from a mathematical point of view in order to generalize, abstract,
  systematize, model, and process them
- The basic skills and advanced knowledge required for advanced study and research in the graduate school or for
  actively working in various fiellfe inv0.0005 Tw4-25.2 -11 [(Th3)-51 (c)2.5 such as(o)1.6 educa1 (9)-5.7 (82 (m)18

identify and solve problems, think logically, give presentations and be more creative.
Academic achievement is evaluated based on grades/scores and performance.

5. Start time and acceptance conditions

In the School of Science, each department holds entrance examinations and stipulates the requirement for admission to the department in its application guidelines. This program is designed mainly for students of the Department of Mathematics. Students will take this program when they enter our department.

This program also accepts all students who have already been accepted to this university. Requirements f students who wish to join the Department of Mathematics are stipulated separately based on the provisions regardi transfer between schools or departments.

6. Obtainable qualifications

Type 1 license for junior high school Mathematics teachers. Type 1 license for senior high school Mathematics Curator license, certification for Assistant Registered Surveyors, qualification for joining the Skill Training course for health controllers in Health Engineering.

7. Class subjects and their contents

* For the class subjects, refer to the subject table in Attachment 1.
* For the details of the class subjects, refer to the syllabus that is published for each academic year.

8. Academic achievement

The evaluation criteria are specified for each academic achievement item, and the achievement level against the criteria is given at the end of the semester.

The evaluation score for each item is converted to a numerical value (S = 4, A = 3, B = 2, and C = 1), and th evaluation standard for academic achievement from the time the student entered the university to the end of the la semester is determined by using these values. The evaluation standards consist of three levels, i.e. Excellent, Very Good, and Good.

Evaluation of academic achievement	Converted value
S (90 or more points)	4
A (80 89 points)	3
B (70 79 points)	2
C (60 69 points)	1

Academic achievement	Evaluation criteria
Excellent	3.00 4.00
Very Good	2.00 2.99
Good	1.00 1.99

* Refer to the relationship between evaluation items and evaluation criteria described in Attachment 2.
* Refer to the relationship between evaluation items and class subjects described in Attachment 3.
* Refer to the curriculum map in Attachment 4.

9>, Graduation thesis (graduation research) (meaning, student allocation, timing, etc.)

1. Requirements

Students make a further, deeper study of theories and knowledge in the research area that they have chosen and organize all of the mathematical knowledge they have acquired up to and including the third year. They also learn to explain their understanding and ideas clearly and effectively while answering questions and engaging in discussion with faculty members and other attendees at events, such as colloquiums. In their graduation research, students who are going to advance to the graduate school acquire further specialized understanding that can be used in their graduate school courses, as well as the abilities and skills required for independent researchers and educators. Students must organize and summarize all of their knowledge from the undergraduate school in the process of preparing and presenting their graduation thesis which will be based on their carefully supervised autonomous study and research.

2. Overview

In the Mathematics Program, students carry out their graduation research by taking the class "Special Study of Mathematics and Informatics for Graduation." The content of the graduation research varies widely depending on the faculty member or group. Students get to know the specialty of each member in the class "Advanced Mathematics" that is provided in the first semester of the third year. Intensive guidance seminars are held to announce the outline of the graduation research several months before starting the research.

3. Lab assignment, timing and method

1 Students are assigned to a laboratory at the beginning of the fourth academic year. To be assigned to a laboratory, students must be qualified to attend the "Special Study of Mathematics and Informatics for Graduation" class.

2 For qualifications to attend "Special Study of Mathematics and Informatics for Graduation", refer to "Qualifications for Attending Special Study of Mathematics and Informatics for Graduation" described in the Study Guidance for the Mathematics Program section of the "Student Handbook" (given when students enter the university).

10>, Responsibility

(1) Responsibility for PDCA (plan, do, check, and act) cycle

The faculty committee of the Mathematics Program (chaired by the Chair of the Department of Mathematics) is engaged in the processes of "plan" and "do."

For the processes of "check" and "act", the Chair of the Department of Mathematics consults with the Curriculum Review Committee of the Department of Mathematics and carries out the required actions while taking the results of the consultation into consideration.

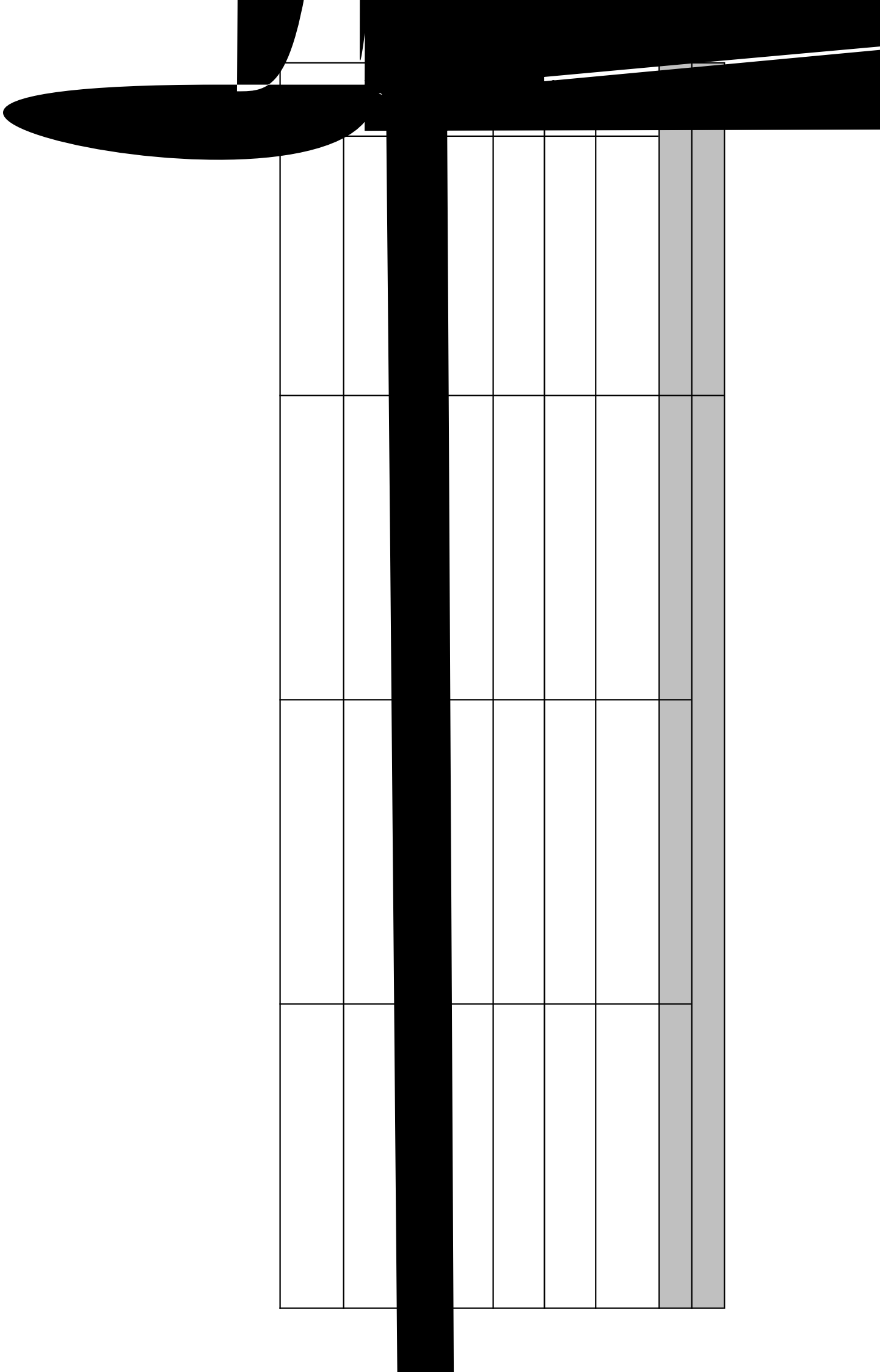
The faculty members who constitute the faculty committee for each major program are listed in Attachment 5.

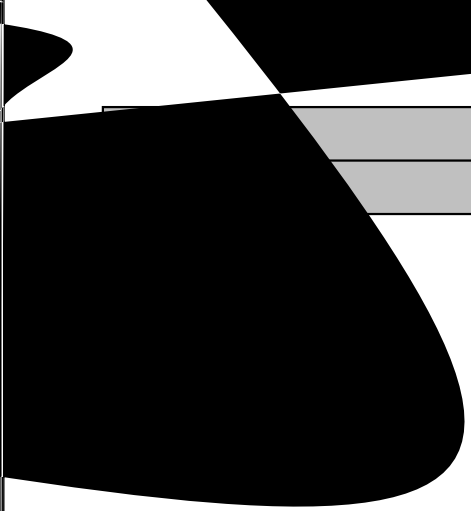
(2) Evaluation of the program

A small-sized consultation meeting with the students of each year is held at the end of the semester to discuss the completed courses. Results of this discussion will be taken into consideration for improving the program.

A booklet entitled "After Completing Lectures" is delivered to faculty members and students after the semester ends to notify them about any updated information concerning course curriculum.

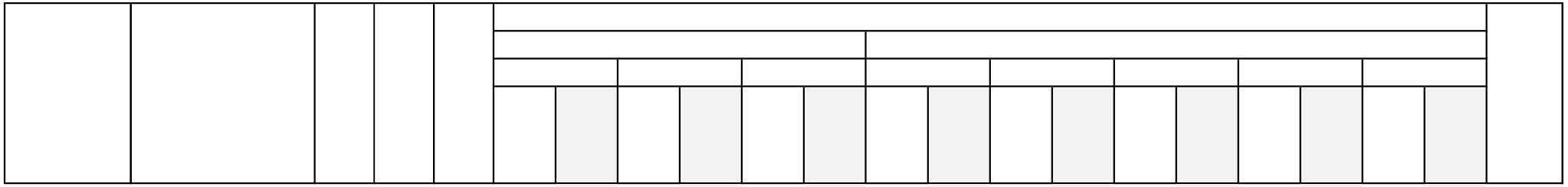
	athematics Internship		1				○			
	pics in Mathematics"	Note 10	Each 2						○	○
	cial Lectures in Mathematics"	Note 11					○	○	○	○
	Specialized Subjects" offered by other s of School of Science that the faculty ee of the Mathematics Program certifies			○	○	○	○	○	○	
	ed Subjects" offered by other of School of Science that the faculty of the Mathematics Program certifies					○	○	○	○	○
Any subject Total				○	○	○	○	○	○	○





Comprehensive A					

The liberal arts education in this program aims to build the academic foundation required for the specialized education, and develops the capability for autonomous study, as well as scientific and mathematical intelligence based on the ability to collect, analyze, and critically evaluate data. It also enables students to establish the perspective necessary to insight into the essentials and background of phenomena, to develop the broad range of knowledge required for living in a modern society, and to integrate such knowledge



Curriculum Map of Mathematics

		Academic ac c base of modern mathematics. Being able						4th grade	
		Spring semester	Fall semester	Spring semester	Fall semester	Spring semester	Fall semester	Spring semester	Fall semester
Knowledge and Understanding		Introductory Seminar for First-Year Students(◎)	Analysis II(◎)	Analysis III(◎)	Analysis IV(◎)				
		Linear Algebra I(◎)	Exercises in Analysis II(◎)	Exercises in Analysis III(◎)	Exercises in Analysis IV(◎)				
		Seminar in Linear Algebra I (◎)	Seminar in Linear Algebra II (◎)	Algebra I(◎)	Algebra II(◎)				
		Introduction to Mathematics (◎)	Linear Algebra II(◎)	Exercises in Algebra I(◎)	Exercises in Algebra II(◎)				
		Analysis I(◎)		Fundamental Concepts of Mathematics I(◎)	Fundamental Concepts of Mathematics II(◎)				
		Exercises in Analysis I(◎)		Exercises in Fundamental Concepts Mathematics I(◎)	Exercises in Fundamental Concepts Mathematics II(◎)				
				Exercises in Mathematical Software(◎)					
	Understanding on primary theory of modern mathematics established on classical theory.				Mathematics for Computation (○)	Algebra A(○)	Algebra B(○)		
						Geometry A(○)	Geometry B(○)		
						Analysis A(○)	Analysis C(○)		
					d ◎)	Analy Mat ematic	s for Computation		
	Being able to understand, learn and explain logical framework and system of basic studying according to each subject and necessary knowledge and skills for constructing learning.								
	Able to understand, learn, and explain the necessity of college education, career education, and a code of ethics.								

Academic achievements Evaluation items		1st grade		2nd grade		3rd grade		4th grade	
		Spring semester	Fall semester	Spring semester	Fall semester	Spring semester	Fall semester	Spring semester	Fall semester
Abilities and Skills	To acquire basic mathematical abilities (Ability to understand concepts, calculation ability, argumentation ability).	Analysis I(◎) Exercises in Analysis I(◎)	Analysis II(◎) Exercises in Analysis II(◎)	Analysis III(◎) Exercises in Analysis III(◎) Algebra I(◎) Exercises in Algebra I(◎) Fundamental Concepts of Mathematics I(◎) Exercises in Fundamental Concepts Mathematics I(◎)	Analysis IV(◎) Exercises in Analysis IV(◎) Algebra II(◎) Exercises in Algebra II(◎) Fundamental Concepts of Mathematics II(◎) Exercises in Fundamental Concepts Mathematics II(◎) Mathematics for Computation(○)	Algebra A(○) Exercises in Algebra A(○) Geometry A(○) Exercises in Geometry A(○) Analysis A(○) Exercises in Analysis A(○) Analysis B(○) Exercises in Analysis B(○) Mathematics for Computation A(○) Probability and Mathematical Statistics A(○) Exercises in Probability and Mathematical Statistics A(○)	Algebra B(○) Exercises in Algebra B(○) Geometry B(○) Exercises in Geometry B(○) Analysis C(○) Exercises in Analysis C(○) Analysis D(○) Exercises in Analysis D(○)	Special Study of Mathematics and Informatics for Graduation(◎)	Special Study of Mathematics and Informatics for Graduation(◎)
	To acquire skills to formulate and solve mathematical questions.				Exercises in Mathematics for Computation(○)	Exercises in Algebra A(○) Exercises in Geometry A(○) Exercises in Analysis A(○) Exercises in Analysis B(○) Exercises in Mathematics for Computation A(○) Exercises in Probability and Mathematical Statistics A(○)	Exercises in Algebra B(○) Exercises in Geometry B(○) Exercises in Analysis C(○) Exercises in Analysis D(○)	Special Study of Mathematics and Informatics for Graduation(◎)	Special Study of Mathematics and Informatics for Graduation(◎)
Abilities and Skills	To learn basic knowledge, skills, and attitudes related to information. Based on them, to be able to process, output and input information, as well as to utilize information appropriately.	Introduction to Information and Data Sciences(◎) Computer Programming(○)	Intelligence and Computer(○) Ground zero programming(○) Fundamental Date Science(○)	Exercises in Mathematical Software(◎)	Exercises in Mathematics for Computation(○) Data Science(△)	Exercises in Mathematics for Computation A(○)	Mathematics for Modeling and Simulation(△)	Special Study of Mathematics and Informatics for Graduation(◎) Theory of Complex Systems(△) Network and Algebra(△)	Special Study of Mathematics and Informatics for Graduation(◎) Mathematics for Computation B(△) Network and Algebra(△)
Abilities and Skills	Being able to conduct daily communication orally or in papl	Communication IA(◎) Communication IB(◎) Foreign Languages: Basic Studies I(○) Foreign Languages: Basic Studies II(○)	Communication IIA(◎) Communication IIB(◎) Foreign Languages: Basic Studies III(○) Foreign Languages: Basic Studies IV(○)						
Abilities and Skills	Through practice of sports, being able to explain the necessity of physical strenth and health promotion.	Basic English Usage I(△) Health and Sports Courses(○)	Basic English Usage II(△) Health and Sports Courses(○)		English Seminar on Mathematics(○)				