Appended Form 1

<div align="center">Specifications for Major Program</div>

Name of School(Program)〔School of Informatics and Data Science(Informatics and Data Science)〕

Program name (Japanese)	情報科学プログラム
(English)	Informatics and Data Science Program

1. Degree to be obtained:

Bachelor of Science in Informatics and Data Science

2. Overview

Because the complexity of economics, society, and the environment is increasing due to rapid globalization, people with the ability to identify problems and find solutions on their own have become indispensable for various organizations. In addition, it is urgently required to develop people capable of efficiently processing and analyzing huge amounts of information and data, so-called "big data", and of developing strategies and plans for their organizations based on evidence.

This program develops specialists who have hybrid capabilities regarding data science and informatics and, are capable of solving individual problems in each academic field. In other words, this program aims to develop specialists who have profound knowledge and understanding for each specialized area, in addition to the basic knowledge and skills in data science and informatics.

The data/network environment in contemporary society has been rapidly developed over the last 20 years. In particular, the amount of data is swelling rapidly (big data), data is becoming more heterogenic and increasing in variety (qualitative/quantitative data, audio, images, movies, documents, graph structures, etc.), and the travel distance and speed of data are dramatically expanding. In today's data science education, therefore, it is required to develop not only expertise in statistics and mathematics, which has been provided in conventional education, but also the ability to collect, process, and analyze various data using advanced information processing technologies and algorithms in order to contribute to the creation of new knowledge and decision making.

However, it is difficult to develop specialists who can work in both fields of data science and informatics by providing only superficial knowledge and skills in those fields, since the two fields have become highly specialized and fragmented. This program aims to develop specialists who can exercise profound understanding and ability in areas of data analysis and system development based on hybrid capabilities in both academic fields.

In this program, up to the second year, all students take the subjects of information mathematics that constitute the basics of information science, as well as core subjects such as probability, statistics,

subjects are designated as required, or elective required subjects. In the second academic year, students take common basic subjects in information science to establish a foundation for study after choosing their course, and to obtain the knowledge required for choosing a course and/or career after graduation.

In the third year, they choose either the data science or the informatics course according to their own interest and aptitude. This program provides such a complex curriculum for the early stages of education

define a research topic related to data science or informatics. Also, students are engaged in research, experimentation, and discussion under the guidance of the faculty member who is engaged in instruction for the thesis, and organize and present their results in their thesis. In these activities, they establish their acquired skills related to the development of an information infrastructure, information processing techniques, and the use of technology for producing new added value through data analysis.

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

This school educates students to become specialists with advanced capabilities in each of data science and informatics, as well as the basic abilities that consist of processing techniques based on the information technology, which are the basis of the information-intensive society of today, as well as advanced data analysis capabilities. In addition, this school aims to develop people who are capable of appropriately managing, processing, and analyzing information that has swelled significantly, and become complicated, due to such phenomena as the accumulation of big data, technological breakthroughs in fields related to artificial intelligence (AI), and the development of the IoT.

This program will award the degree of Bachelor of Science in Informatics and Data Science to students who have acquired the knowledge and abilities described below, and earned the required credits defined for the educational course:

Achievement tar(1e08 * n1 1 46.8 501.07i.a)11(n-28-4(ckil)-2(ti)16(ef99-5(las)-31(d)28(th)11(9(beco)108 *)

information technology.

Achievement target I3. Knowledge related to hardware and software, and the programming skills required for efficiently processing data.

Achievement target E. Creative and logical thinking ability for analyzing practical issues and challenges in order to provide rational solutions that match social needs, as well as the capability to realize these solutions.

4.Curriculum policy (policy for arranging and implementing the curriculum)

To enable students to achieve the targets that are defined for the program, the curriculum of the Informatics and Data Science Program is organized and implemented according to the policies described below. Academic achievement is evaluated based on the grade scores for the subjects and the level of achievement against the target defined for this program.

・In the first academic year, students take liberal arts core subjects, common subjects (foreign language subjects and health and sports subjects), and fundamental subjects (subjects related to mathematics and statistics). These subjects respectively correspond to the achievement targets A, B, C1, and E; those of C1 and C2; and those of A and B.

・In the second academic year, all students take the specialized core subjects. The same specialized core subjects are designated for both courses, and all of them are designated as required subjects or elective required subjects. Specialized core subjects consist of information mathematics subjects (corresponding to the achievement targets A and B), probability and statistics subjects (achievement targets A, B, D1, D2, and D3), computer science subjects (achievement targets A, B, I1, I2, and I3), and applied mathematics subjects (achievement target I1).

・In the third academic year, students take subjects that are deeply related to either the data science course or the informatics course. Different specialized subjects are designated (required subjects, elective required subjects, free elective subjects, and subjects without designation) for each course. They consist of data science subjects that correspond to one or more of the achievement targets D1, D2, and D3, and informatics subjects the correspond to one or more of the achievement targets I1, I2, and I3. Students

6.Obtainable qualifications

Educational personnel certification (Information teaching and Mathematics) is awarded to the student who earns the required credits.

7.Class subjects and their contents

* For class subjects, refer to the subject table in Attachment 1. (The subject table is to be attached.)

* For the details of the class subjects, refer to the syllabus that is published each academic year.

8.Academic Achievement

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

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

Achievement evaluation	Numerical conversion
S (Excellent: 90 or more points)	4

Detailed objectives are as follows:

1. To acquire the ability to develop a research plan for their research objective on their own, and to carry out their research according to that plan.

2. To develop skills for collecting materials related to the research objective, understanding the objective, and identifying problems.

3. To develop capabilities for analyzing problems related to the research objective and providing solutions that match social needs.

4. To develop skills required for research activity related to reading, writing, and searching for information in English.

5. To develop documentation skills for organizing research results and describing the meaning and efficacy of the obtained results in logical and consistent text.

cycle?

○ Evaluation method

・Each subject in the program is evaluated based on student evaluation of the classes and achievement evaluation results.

・For evaluation of the upward spiral in quality of the program, questionnaires for students are conducted in an appropriate cycle, and the opinions of ex-students and companies are collected.

○ Policy and method for feedback to students

・For individual classes, the faculty member who is in charge of the class makes comments on the evaluation of the class and the achievement evaluation results.

・Actions taken, such as changes to the structure of the program, are published on the web site of School of Informatics and Data Science and/or another medium with the reason.

Sheet 1

Table of Registration Standards for Liberal Arts Education Subjects
Informatics and Data Science Program

◎ Required subject (period of registration specified)

○ Compulsory elective subject (any of these subjects shall be registered)

Subject Type				Required No. of Credits	Class Subjects, etc.	No. of Credits	Type of Course Registration	1y1	1y2	1y3	1y4	2y1	2y2	2y3	2y4	3y1	3y2	3y3	3y4	4y1	4y2	4y3	4y4
Liberal Arts Education Subjects	Peace Science Courses			2	Peace Science Courses	2	Compulsory elective		○														
	Basic Courses in University Education	Introduction to University Education		2	Introduction to University Education	2	Required	◎															
		Introductory Seminar for First-Year Students		2	Introductory Seminar for First-Year Students	2	Required	◎															
	Common Subjects	Area Courses		8	4 credits from Courses in Arts and Humanities/Social Sc	2	Compulsory elective	○	○	○	○	○	○	○	○								
		Foreign Languages	English (Note 2·3) — Basic English Usage	2	Basic English UsageI	1	Required	◎															
					Basic English UsageII	1				◎													
			Communication I	2	Communication I A	1	Required	◎															
					Communication I B	1		◎															
			Communication II	2	Communication II A	1	Required		◎														
					Communication II B	1			◎														
			Communication III	2	CommunicationIIIA	1	Compulsory elective						○		○								
					Communication IIIB	1							○		○								
					Communication IIIC	1							○		○								
			Select two subjects from the three subjects above																				
			Initial Foreign Languages (Select one language from German, French and Chinese)	2	Two subjects from Basic language I	1	Compulsory elective	○															
	Health and Sports Courses			2		1or 2	Compulsory elective	○		○													
	Basic Subjects			12	Elements of Calculus (Note 4)	2	Compulsory elective	○															
					Seminar in Basic Mathematics I (Note4)	1		○															
					Seminar in Basic Mathematics II (Note4)	1				○													
					Statistical Data Analysis	2	Required	◎															
					CalculusI	2			◎														
					CalculusII	2	Required			◎													
					Linear Algebra I	2			◎														
					Linear Algebra II	2				◎													
No. of Credits Required for Graduation				38																			

Note 1: If a student failed to earn the credit in the term or semester indicated with the mark "   " or "   " in the column of "Academic year", it is allowed to take the subject in a following term or semester. It is required to confirm the semester in which the subject is provided in the class schedule for liberal arts education subjects that is published for every academic year, because some subjects might be provided in a term or semester other than that which is shown in this document.

Note 2: The credit for "Field Research in the English-speaking World" and that for "Online English Seminar A" and "Online English Seminar B", that are earned through a program of self-study, are not accepted as the credit for graduation. However, a credit for foreign language study abroad might be accepted as that for "Basic English Usage I", "Basic English Usage II", or "Basic English Usage III" based on advance application. For the details, refer to the description regarding English subjects in liberal arts education in the Students Handbook.

Note 3: Achievement in a foreign language skill test might be accepted as a credit. For the details, refer to the description regarding English subjects in liberal arts education in the Students Handbook.

Note 4: Students who took four mathematics subjects (Math I, Math II, Math A, and Math B) in the entrance examination are required to take the subject "Elements of Calculus." Students who took five mathematics subjects (Math I, Math II, Math III, Math A, and Math B) in the entrance examination are required to take the subjects "Seminar in Basic Mathematics I" and "Seminar in Basic Mathematics II."

Basic Specialized Subjects for Imformatics and Data Science Program

◎ Required subject
○ Compulsory elective subject
△ Free elective subject

Subject Type	Class Subjects	Credits	Data Science	informatics	1y-1	1y-2	1y-3	1y-4	2y-1	2y-2	2y-3	2y-4	3y-1	3y-2	3y-3	3y-4	4y-1	4y-2	4y-3	4y-4	Note
Core Subjects	Discrete Mathematics I	2	◎	◎		4															
	Discrete Mathematics II	2	◎	◎			4														
	Programming I	2	◎	◎	2																
	Programming II	2	◎	◎			2														
	Programming III	2	◎	◎						2											
	Programming IV	2	◎	◎							2										
	Theory of Automata and Languages	2	◎	◎					4												
	Digital Circuit Design	2	◎	◎							4										
	Programming Languages	2	◎	◎								4									
	Algorithms and Data Structures	2	◎	◎							4										
	Fundamentals of Probability Theory	2	◎	◎				4													
	Inferential Statistics	2	◎	◎					4												
	Linear Regression Model	2	◎	◎						4											
	Statistical Test	2	◎	◎						4											
	Generalized Linear Model	2	○	○							4										
	Stochastic Modeling	2	○	○								4									
	Numerical Computation	2	○	○								4									
	Mathematical Programming	2	○	○					4												
	System Optimization	2	○	○							4										
	Differential Equations	2	○	○					4												
	Fourier Analysis	2	○	○						4											
	Multivariate Analysis	2	○	○							4										
	Basic and practice in Categorical data analysis	2	○	○						4											
	Computer Architecture	2	○	○								4									
	Operating Systems	2	○	○							4										
	Databases	2	○	○								4									
	Software Engineering	2	○	○						4											
	Information Theory	2	○	○					4												
	Practical English I	1	◎	◎									4								
	Practical English II	1	◎	◎											4						
Specialized Subjects	Informatics and data science, Exercise I	1	◎	◎									3								
	Informatics and data science, Exercise II	1	◎	◎										3							
	Informatics and data science, Exercise III	1	◎	◎											3						
	Informatics and data science, Exercise IV	1	◎	◎												3					
	Theory of Computing	2		◎									4								
	Image Processing	2		○										4							
	Visual Computing	2	△	○											4						
	Artificial Intelligence and Machine Learning	2	△	○											4						
	Computer Network	2	△	◎												4					
	Human Computer Interaction	2	△	○											4						
	Parallel and Distributed Processing	2	△	○											Intensive course						
	Software Management	2	△	○										Intensive course							
	Natural Language Processing	2	○	○										4							
	Information Society and Security	2	○	○										4							
	Data Mining	2	◎	△									4								
	Survey design	2	○	△									4								
	Nonparametric analysis	2	◎	△										4							
	Big Data	2	◎	◎											4						
	Behaviormetrics	2	○	△										4							
	Econometrics	2	○	△										4							
	Time Series Analysis	2	○	△											4						
	Biostatistics	2	○											4							
	Biomedical Statistics	2	○														4				
	Stochastic Processes	2	○	○												4					
	Financial Engineering	2	○	○												4					
	Data Analysis for Medical and Welfare Policies	2	△	△												Intensive course					
	Society and Data Analysis	2	△	△											Intensive course						
	Total Quality Management and Data Analysis	2	△	△											Intensive course						
	Education Policy and Data Analysis	2	△	△										Intensive course							
	Data Science Seminar I	1	◎														4			
	Data Science Seminar II	1	◎															4		
	Informatics Seminar I	1		◎													4			
	Informatics Seminar II	1		◎														4		
	Graduation Thesis	3	◎	◎															6	

Academic Achievement in Educational Program for Informatics and Data Science Program

The Relationship between Evaluation Items and Evaluation Criteria

Academic Achievements			Evaluation Criteria		
Evaluation Items			Excellent	Very Good	Good
Knowledge & understanding	(1)	C1. Knowledge and capabilities required for solving problems, while understanding that various problems of human beings, societies, and individuals can be interpreted in different ways according social conditions, cultures, etc.	Fully understands various problems related to human beings, societies, and individuals and their variety, and has a sufficient level of knowledge required for solving these problems.	Understands various problems related to human beings, societies, and individuals and their variety at a standard level, and has a standard level of knowledge required for solving these problems.	Understands various problems related to human beings, societies, and individuals and their variety at a minimum level, and has a minimum level of knowledge required for solving these problems.
	(2)	D1. Knowledge and skills required for understanding the theoretical system of statistics and data analysis, and for precisely and efficiently analyzing qualitative/quantitative information in big data.	Fully understands the theoretical system of statistics and data analysis, and has sufficient knowledge for precisely and efficiently analyzing big data.	Understands the theoretical system of statistics and data analysis at a standard level, and has a standard level of knowledge for precisely and efficiently analyzing big data.	Understands the theoretical system of statistics and data analysis at a minimum level, and has a minimum level of knowledge for precisely and efficiently analyzing big data.
	(3)	I1. Knowledge and ability required for collecting and processing high-dimensional data using information processing technologies based on scientific logic, while understanding the theoretical system that forms the basis of informatics.	Has sufficient knowledge required for collecting and processing high-dimensional data using information processing technologies, while fully understanding the theoretical system of informatics.	Has a standard level of knowledge required for collecting and processing high-dimensional data using information processing technologies, while having a standard level of understanding on the theoretical system of informatics.	Has a minimum level of knowledge required for collecting and processing high-dimensional data using information processing technologies, while having a minimum level of understanding on the theoretical system of informatics.
Ability & skills	(1)	A. Skills related to the development of an information infrastructure,information processing techniques, and technology for producing new added value through data analysis.	Has fully acquired skills and is capable of exercising them regarding the development of an information infrastructure,information processing techniques, and technology for producing new added value through data analysis.	Has acquired skills and is capable of exercising them at a standard level regarding the development of an information infrastructure,information processing techniques, and technology for producing new added value through data analysis.	Has acquired skills and is capable of exercising them at a minimum level regarding the development of an information infrastructure,information processing techniques, and technology for producing new added value through data analysis.
	(2)	B. Ability to identify and solve new problems on their own by quantitative and logical thinking based on data, diverse perspectives, and advanced skills for information processing and analysis.	Has acquired a sufficient level of ability to identify and solve new problems their own by quantitative and logical thinking based on data, diverse perspectives, and advanced skills for information processing and analysis, and is capable of exercising this ability.	Has acquired a standard level of ability to identify and solve new problems on their own by quantitative and logical thinking based on data, diverse perspectives, and advanced skills for information processing and analysis, and is capable of exercising this ability.	Has acquired a minimum level of ability to identify and solve new problems on their own by quantitative and logical thinking based on data, diverse perspectives, and advanced skills for information processing and analysis, and is capable of exercising this ability.
	(3)	D2. Ability to develop strategies and plans for an organization based on statistical evidence by using a wide range of knowledge and skills related to data science.	Has acquired a sufficient level of ability to develop strategies and plans for an organization based on statistical evidence by using knowledge and skills related to data science, and is capable of exercising this ability.	Has acquired a standard level of ability to develop strategies and plans for an organization based on statistical evidence by using knowledge and skills related to data science, and is capable of exercising this ability.	Has acquired a minimum level of ability to develop strategies and plans for an organization based on statistical evidence by using knowledge and skills related to data science, and is capable of exercising this ability.
	(4)	I3. Knowledge related to hardware and software, and the programming skills required for efficiently processing data.	Has acquired knowledge regarding hardware and software, and the programming skills required for efficiently processing data at a sufficient leve,l and is capable of exercising these skills.	Has acquired knowledge regarding hardware and software, and the programming skills required for efficiently processing data at a standard level, and is capable of exercising these skills.	Has acquired knowledge regarding hardware and software, and the programming skills required for efficiently processing data at a minimum level, and is capable of exercising these skills.

Academic Achievements			Evaluation Criteria		
Evaluation Items			Excellent	Very Good	Good
Comprehensive capability	(1)	C2. Skills for communication, reading, and writing in English, capabilities required for giving a good, clear oral presentation, and documentation and communication skills that contribute to active discussion.	Has acquired skills for communication in English, and the presentation and documentation skills required for research activities at a sufficient level, and is capable of exercising these skills.	Has acquired skills for communication in English, and the presentation and documentation skills required for research activities at a standard level, and is capable of exercising these skills.	Has acquired skills for communication in English, and the presentation and documentation skills required for research activities at a minimum level, and is capable of exercising these skills.
	(2)	D3. Ability to examine social needs and issues which are interlinked in a complex manner, using a top-down view to solve the problems through quantitative and logical thinking based on data, diverse perspectives, and advanced skills in information processing and analysis.	Has acquired the ability to solve problems by quantitative and logical thinking based on data, diverse perspectives, and advanced skills for information analysis at a sufficient level, and is capable of exercising these skills.	Has acquired the ability to solve problems by quantitative and logical thinking based on data, diverse perspectives, and advanced skills for information analysis at a standard level, and is capable of exercising these skills.	Has acquired the ability to solve problems by quantitative and logical thinking based on data, diverse perspectives, and advanced skills for information analysis at a minimum level, and is capable of exercising these skills.
	(3)	I2. Ability to provide the most appropriate system solution to a cross-sectional problem in the diversified and complicated information society based on the many forms of cutting edge information technology.	Has a sufficient level of ability to provide the most appropriate system solution to a cross-sectional problem in the information society based on the many forms of cutting edge information technology, and is able to exercise this ability.	Has a standard level of ability to provide the most appropriate system solution to a cross-sectional problem in the information society based on the many forms of cutting edge information technology, and is able to exercise this ability.	Has a minimum level of ability to provide the most appropriate system solution to a cross-sectional problem in the information society based on the many forms of cutting edge information technology, and is able to exercise this ability.
	(4)	E. Creative and logical thinking ability for analyzing practical issues and challenges in order to provide rational solutions that match social needs, as well as the capability to realize these solutions.	Has acquired a sufficient level of ability for creative and logical thinking required for analyzing practical issues and challenges to provide a rational solution that matches social needs, as well as the capabilities for realizing the solution, and is capable of exercising this ability.	Has acquired a standard level of ability for creative and logical thinking required for analyzing practical issues and challenges to provide a rational solution that matches social needs, as well as the capabilities for realizing the solution, and is capable of exercising this ability.	Has acquired a minimum level of ability for creative and logical thinking required for analyzing practical issues and challenges to provide a rational solution that matches social needs, as well as the capabilities for realizing the solution, and is capable of exercising this ability.

Placement of the Liberal Arts Education in the Major Program

The liberal arts education in this program aims to build the academic foundation required for the specialized education. Students take such subjects as foreign language subjects and disciplinary subjects in order to develop deep humanity, flexibility, and profound intelligence to foster the basic qualifications and abilities required for working globally in an international society. In addition, they acquire the knowledge and skills that constitute the basis of the specialized education in the fundamental subjects related to such things as mathematics and statistical data analysis.

AT c bW b Tcf TT cWr 4e d c   cT b S 2 bb Bd TReb

Each data cell below lists the value and its accompanying count "1". Column groups are numbered 1–12 (original headers are a corrupted font rendering: "4e d c cT b" / "f TS T S D STabc S" / "c Tb S B b" / "2 aTWr beT c Tb", with repeated sub-labels "T WT Se dTb U Te d c cWr bd TRe" and "T Web TS e dTb Te d c cT b bd TRe").

Category	Course (2 bb Bd TReb)	Cr	Grade	1	2	3	4	5	6	7	8	9	10	11	12	Total
Liberal Arts Education	Introduction to University Education	2	1st grade	100 1												100
Liberal Arts Education	Introductory Seminar for First-Year Students	2	1st grade	25 1			25 1	25 1							25 1	100
Liberal Arts Education	Peace Science Courses	2	1st grade	100 1												100
Liberal Arts Education	Area Courses	8	1st grade	100 1												100
Liberal Arts Education	Basic English Usage I	1	1st grade									100 1				100
Liberal Arts Education	Basic English Usage Ⅱ	1	1st grade									100 1				100
Liberal Arts Education	Communication ⅠA	1	1st grade									100 1				100
Liberal Arts Education	Communication ⅠB	1	1st grade									100 1				100
Liberal Arts Education	Communication ⅡA	1	1st grade									100 1				100
Liberal Arts Education	Communication ⅡB	1	1st grade									100 1				100
Liberal Arts Education	Communication ⅢA	1	2nd grade									100 1				100
Liberal Arts Education	Communication ⅢB	1	2nd grade									100 1				100
Liberal Arts Education	Communication ⅢC	1	2nd grade									100 1				100
Liberal Arts Education	Basic Foreign Languages I	2	1st grade									100 1				100
Liberal Arts Education	Basic Foreign Languages Ⅱ	2	1st grade									100 1				100
Liberal Arts Education	Health and Sports Subject	2	1st grade	100 1												100
Liberal Arts Education	Elements of Calculus	2	1st grade				50 1	50 1								100
Liberal Arts Education	Seminar in Basic Mathematics I	1	1st grade				50 1	50 1								100
Liberal Arts Education	Seminar in Basic Mathematics Ⅱ	1	1st grade				50 1	50 1								100
Liberal Arts Education	Statistical Data Analysis	2	1st grade				50 1	50 1								100
Liberal Arts Education	Calculus I	2	1st grade				50 1	50 1								100
Liberal Arts Education	CalculusⅠ Ⅱ	2	1st grade				50 1	50 1								100
Liberal Arts Education	Linear Algebra I	2	1st grade				50 1	50 1								100
Liberal Arts Education	Linear Algebra Ⅱ	2	1st grade				50 1	50 1								100
Specialized Education	Discrete Mathematics I	2	1st grade				50 1	50 1								100
Specialized Education	Discrete Mathematics Ⅱ	2	1st grade				50 1	50 1								100
Specialized Education	Programming I	2	1st grade				50 1	50 1								100
Specialized Education	Programming Ⅱ	2	1st grade				50 1	50 1								100
Specialized Education	Programming Ⅲ	2	2nd grade				50 1	50 1								100
Specialized Education	Programming Ⅳ	2	2nd grade				50 1	50 1								100
Specialized Education	Theory of Automata and Languages	2	2nd grade			34 1	33 1	33 1								100
Specialized Education	Digital Circuit Design	2	2nd grade				33 1	33 1		34 1						100
Specialized Education	Programming Languages	2	2nd grade				33 1	33 1		34 1						100
Specialized Education	Algorithms and Data Structures	2	2nd grade				33 1	33 1						34 1		100
Specialized Education	Fundamentals of Probability Theory	2	1st grade		34 1		33 1	33 1								100
Specialized Education	Inferential Statistics	2	2nd grade		34 1		33 1	33 1								100
Specialized Education	Linear Regression Model	2	2nd grade		34 1		33 1	33 1								100
Specialized Education	Statistical Test	2	2nd grade		34 1		33 1	33 1								100
Specialized Education	Generalized Linear Model	2	2nd grade						100 1							100
Specialized Education	Stochastic Modeling	2	2nd grade						100 1							100
Specialized Education	Numerical Computation	2	2nd grade											100 1		100
Specialized Education	Mathematical Programming	2	2nd grade											100 1		100
Specialized Education	System Optimization	2	2nd grade											100 1		100
Specialized Education	Differential Equations	2	2nd grade			100 1										100
Specialized Education	Fourier Analysis	2	2nd grade			100 1										100
Specialized Education	Multivariate Analysis	2	2nd grade		100 1											100
Specialized Education	Basic and practice in Categorical data analysis	2	2nd grade										100 1			100
Specialized Education	Computer Architecture	2	2nd grade								100 1					100
Specialized Education	Operating Systems	2	2nd grade								100 1					100
Specialized Education	Databases	2	2nd grade			100 1										100
Specialized Education	Software Engineering	2	2nd grade											100 1		100
Specialized Education	Information Theory	2	2nd grade			100 1										100
Specialized Education	Practical English I	1	3rd grade									100 1				100
Specialized Education	Practical English Ⅱ	1	3rd grade									100 1				100

| | | | | 4e d c cT b | | | | | | | | | | | | | | | | | dTb U cW |
| | | | | f TS T S D STabc S | | | | | | | | c Tb S B b | | | | 2 aTWT beT c Tb | | | | | | |
Category	Course		Grade	2		□3		″				□1		″3□		″	2□		□3″		″□	4	
Specialized Education	Informatics and data science, Exercise Ⅰ	1	3rd grade					33	1	33	1					34	1							100
Specialized Education	Informatics and data science, Exercise Ⅱ	1	3rd grade					33	1	33	1					34	1							100
Specialized Education	Informatics and data science, Exercise Ⅲ	1	3rd grade			34	1			33	1	33	1											100
Specialized Education	Informatics and data science, Exercise Ⅳ	1	3rd grade			34	1			33	1	33	1											100
Specialized Education	Theory of Computing	2	3rd grade					50	1	50	1													100
Specialized Education	Image Processing	2	3rd grade													100	1							100
Specialized Education	Visual Computing	2	3rd grade													100	1							100
Specialized Education	Artificial Intelligence and Machine Learning	2	3rd grade					100	1															100
Specialized Education	Computer Network	2	3rd grade							50	1					50	1							100
Specialized Education	Human Computer Interaction	2	3rd grade													100	1							100
Specialized Education	Parallel and Distributed Processing	2	3rd grade													100	1							100
Specialized Education	Software Management	2	3rd grade																	100	1			100
Specialized Education	Natural Language Processing	2	3rd grade					100	1															100
Specialized Education	Information Society and Security	2	3rd grade																	100	1			100
Specialized Education	Data Mining	2	3rd grade	50	1			50	1															100
Specialized Education	Survey design	2	3rd grade									100	1											100
Specialized Education	Nonparametric analysis	2	3rd grade	50	1			50	1															100
Specialized Education	Big Data	2	3rd grade					50	1									50	1					100
Specialized Education	Behaviormetrics	2	3rd grade	100	1																			100
Specialized Education	Econometrics	2	3rd grade															100	1					100
Specialized Education	Time Series Analysis	2	3rd grade									100	1											100
Specialized Education	Biostatistics	2	3rd grade															100	1					100
Specialized Education	Biomedical Statistics	2	3rd grade															100	1					100
Specialized Education	Stochastic Processes	2	3rd grade															100	1					100
Specialized Education	Financial Engineering	2	3rd grade															100	1					100
Specialized Education	Data Analysis for Medical and Welfare Policies	2	3rd grade									100	1											100
Specialized Education	Society and Data Analysis	2	3rd grade															100	1					100
Specialized Education	Total Quality Management and Data Analysis	2	3rd grade															100	1					100
Specialized Education	Education Policy and Data Analysis	2	3rd grade									100	1											100
Specialized Education	Data Science Seminar Ⅰ	1	4th grade	33	1							33	1					34	1					100
Specialized Education	Data Science Seminar Ⅱ	1	4th grade	33	1							33	1					34	1					100
Specialized Education	Informatics Seminar Ⅰ	1	4th grade			33	1									33	1			34	1			100
Specialized Education	Informatics Seminar Ⅱ	1	4th grade			33	1									33	1			34	1			100
Specialized Education	Graduation thesis	3	4th grade									50	1									50	1	100

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