For entrants in AY 2023

Appended Form 1 1. Degree to be obtained: Bachelor of Science in Informatics and Data Science 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 in the undergraduate school in order to develop people who have a broad perspective that covers multiple fields, as well as a high level of capabilities as specialists in their own field.

(Data science course)

The data science course is organized in a way that attaches importance to data analysis based on statistics, and consists of academic fields related to the development of specialists, such as data analysts and information service analysts, who are engaged in processing and analysis of huge amounts of information such as big data and high-dimensional data. In this course, students learn the system of knowledge and skills for solving high-dimensional, data-based problems by fully exercising their knowledge of statistics and skills in information processing. Through this process, this course educates students to be able to solve problems by quantitative and logical thinking based on data, to use diverse points of view and advanced information processing capabilities, and to understand the theoretical system of statistics and data analysis in order to precisely and efficiently analyze various information.

(Informatics course)

The informatics course aims to educate students to study basic and systematic knowledge and skills related to data analysis, and to systematically learn computer software and architecture, operating systems, computer networking, and information processing technologies in various media to enable them to become system engineers who support the basis of the information-intensive society of today. In addition, this course educates students to study subjects related to the structure and development of information processing systems, parallel distributed processing and machine learning, intelligent calculation such as data mining, data analysis, and model construction using network systems, in order to develop information service engineers who can provide the most appropriate system solutions based on many forms of information technology.

In the fourth year, as a preparation for graduation thesis, students attend seminars provided in both the data science course and the informatics course under the guidance of the faculty members who are engaged in instruction for the thesis. In the seminar, students have the opportunity to familiarize themselves with state-of-art results in the academic field through colloquiums on research papers and textbooks in the specialized area in order to learn and acquire the study methods in each area, the methods for identifying and solving problems, capabilities for literature based research, and presentation and communication skills required for discussion of the research. In preparing their graduation thesis, students use the specialized knowledge, skills, and abilities that they have acquired in the Informatics and Data Science Program to pursue an advanced research topic. For preparation of the graduation thesis, therefore, they are required to have not only knowledge of the specialized area but also an ability for research planning, a positive attitude, a cooperative mindset, and the capacity for continuous effort. This program educates students to comprehensively improve these capabilities in order to enable them to acquire the ability to identify and solve new problems on their own. Specifically, students individually 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 target A. Skills related to the development of an information infrastructure, information processing techniques, and technology for producing new added value through data analysis.

Achievement target 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.

Achievement target 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 to social conditions, culture, etc.

Achievement target 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.

Achievement target 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.

Achievement target 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.

Achievement target 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.

Achievement target 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.

Achievement target 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.

to have an individual consultation with the faculty committee members in School of Informatics and Data Science. Teach-in-English course is managed with two languages simultaneously, which is categorized into Type B, except in a few classes. In this program, students are allocated to one of the two courses at the end of the second academic year. To be allocated to a course, students are required to earn 68 or more credits by the end of the second academic year.

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 deta BDC tho (u)8.77 (h)-2.7 (e)11.6 (d)-5.5(a)-0.8 (s)8.4 (s)-2.9 ((u)8.6 (a)10.5 (r)0.97 (b)-0.8 (j)61.9 (ec)

skills, and abilities that they have acquired in the Informatics and Data Science Program to pursue an advanced research topic. To take this subject, therefore, they are required to have not only knowledge of the specialized area but also an ability for research planning, a positive attitude, a cooperative mindset, and the capacity for continuous effort. This program educates students to comprehensively improve these capabilities in order to allow them to acquire the ability to identify and solve new problems on their own. 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.
- 6. To develop presentation skills for delivering the research results clearly and orally, and communication skills for active discussion.

t allocation method and timing

Students in their fourth or senior year, who satisfy the requirements for starting the research for their graduation thesis, are allocated to a laboratory according to their wishes. The allocation method will be explained to the students at a briefing session that will be held before the allocation process. For students to be allocated to laboratories, an assembly and/or open laboratory event is held in February or March to show the details of research topics.

This program is executed by faculty members who support the education in the Informatics and Data Science Program. The dean of School of Informatics and Data Science takes on the responsibility for implementation of the program. It is mainly the Informatics and Data Science Program committee that reviews and makes decisions related to the processes of the PDCA cycle (plan, do, check, and act) in the council of the School of Informatics and Data Science (this is held, in principle, on the first Thursday of every month). In some cases, a working group may be organized according to direction by the dean of

either of the courses, laboratories which are mainly engaged in the concerned course will take responsibility. In such a case, the dean of the school designates the person in charge.

(2) Evaluation of the program

Are class subjects arranged appropriately, while considering the aims of study and education in this program? Are the contents of classes appropriate?

Have students, on average, achieved the level that is required of them?

Is the system for achieving an upward spiral in the program functioning according to an appropriate cycle?

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.

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

- © Required subject (period of registration specified)

 Compulsory elective subject (any of these subjects shall be registered)
- 2 Peace Science Courses
 2 Introduction to University Education
 2 Introductory Seminar for First-Year
 Students
- 2 Compulsory elective
 2 Required ©
 2 Required ©

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Required subject Compulsory elective subject Free elective subject

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Subject Type		ts	1 ype or							1		Cit	133 110	urs/ **								
ect	Class Subjects	Credits	puter	Data Science	Intelligence Science		1st	year			2nd	year			3rd	year			4th	year		Note
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	Discrete Mathematics I	2					4															
	Discrete Mathematics II	2						4														
	Programming I	2					2															
	Programming II	2							2													
	Programming III	2									2										\blacksquare	
	Programming IV	2											3									
	Theory of Automata and Languages	2		Δ						4												
	Digital Circuit Design	2		Δ								4										
	Programming Languages	2											4									
	Algorithms and Data Structures	2										4										
	Fundamentals of Probability Theory	2							4													
	Inferential Statistics	2	Δ							4												
		2	Δ							1	4											
	Statistical Test	2	Δ								4											
	Stochastic Modeling	2	Δ							1	-		4									
	Numerical Computation	2			-					1			4									
	Mathematical Programming	2								-			4									
										4												
	System Optimization	2										4										
	Mathematical Analysis	2			-	-	-	_	_	 	4			<u> </u>	_			-		-		
	Multivariate Analysis	2	Δ							-		4										
	Basic and practice in Categorical data analysis	2	Δ								4											
	Mechanism how programs run on computer	2		Δ									4									
	Operating Systems	2		Δ						<u>_</u>		4							Ш¯			
	Databases	2	L	Δ		L	L	L	L	L	L	L T	4	L	L	L	L	L	L	L	LΠ	
	Information Theory	2		Δ						4	4											
	Practical English I	1												4								
	Practical English II	1														4						
	Informatics and Data Science Exercise I	1												3								
	Informatics and Data Science Exercise II	1								1					3							
	Informatics and Data Science Exercise III	1	l			1				†					Ť	3		l				
	Informatics and Data Science Exercise IV	1														3	3					
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	Software Engineering I	2													4							
	Software Engineering II	2														4						
	Theory of Computing	2		Δ										4								
	Image Processing	2		Δ											4							
ts	Visual Computing	2		Δ												4						
Specialized Subjects	Introduction to Artificial Intelligence	2								4						4						
Su	Computer Network	2		Δ													4					
sed	Human Computer Interaction	2		Δ												4						
aliz	Parallel and Distributed Processing	2		Δ												Intensive course						
)ec	Software Management	2		Δ											Intensive course							
S	Natural Language Processing	2		Δ											4							
	Information Society and Security	2		Δ	ļ										4							
	Digital Signal Processing	2		Δ	ļ									4								
	Data Mining	2	Δ											4								
	Survey design	2	Δ											4								
	Nonparametric analysis	2	Δ		.					1				4	4							
		2	Δ												4							
	Big Data									-							4					
	Behaviormetrics	2	Δ							-				4								
	Econometrics	2	Δ												4							
	Time Series Analysis	2	Δ													4						
	Biostatistics	2	Δ			-				<u> </u>							4					
	Stochastic Processes	2	Δ				ļ			ļ							4			ļ		
	Financial Engineering	2	Δ							<u>_</u>							4		Ш_			
	Speech Recognition	2								1				4				1				
	Text Mining	2															4					
	Machine Learning	2										4										
	Reinforcement Learning	2													4							
	Decision-Making	2								l					4							
	Introduction to IoT	2								l							4					
	Biological Information Processing	2														4	Ť					
	Bioinformatics	2													4	*						
	Sparse Estimation	2						 	 	1	 			4	**			1				
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	Advanced Programming	2				-	-			-							4	-		-		
	Neural Networks	2		Δ		-	-	-	-	}—				4	-			 		-		
	Bayesian Statistics	2	Δ			<u> </u>				₽				4				-				
	Semiotic AI	2				-				<u> </u>					4							
	Mathematical Statistics	2	Δ													4						
	FinTech	2	Δ												4							
	Quality Management	2	L			L	L	L	L	L	L	L T	LΠ	L	L	L	4	L	L	L	LΠ	
	Computer Science Seminar I	1																4				
	Computer Science Seminar II	1																	4			
	Data Science Seminar I	1																4				
	Data Science Seminar II	1								l									4			
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	Graduation Thesis	3				-	-			-				-				-		- '	6	
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Practical Subjects	Data Science and Management	2				ļ				 	<u> </u>	4										
l Su	Frontier of Informatics and Data Science	2												4								
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racı	Long-term Fieldwork I	3				\Box	\Box			$ldsymbol{ldsymbol{ldsymbol{eta}}^{-}}$	\Box		L∏	L	\Box	Intensiv	e course	L^{T}	┕	\Box	\Box	
Д	Long-term Fieldwork II	3								1								1	1	Intensiv	e course	
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Academic Achievement in Educational Program for Informatics and Data Science Program The Relationship between Evaluation Items and Evaluation Criteria

The Relationship between Evaluation Items and Evaluation Criteria Academic Achievements Evaluation Criteria												
		Evaluation Items	Excellent	Very Good	Good							
nding	(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.	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.							
Knowledge & understanding	(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.							
Know	(3)	processing high-dimensional data using information processing technologies based on scientific logic, while understanding the theoretical system that forms the	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.							
	(1)	A. Skills related to the development of an information	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.							
& skills	(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.							
Ability o	(3)	DZ. Ability to develop strategies and plans for an organization based on statistical evidence by using a wide representation of the population and skills related to date	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)	the programming skills required for efficiently	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.							

	(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.	the presentation and documentation skills required for	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.
ive capability	(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.	quantitative and logical thinking based on data, diverse	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.
Comprehensiv	(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 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.	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	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.

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Subject Type	Class Subjects	Credits	Grade	Weighte d values	Weights	Weighte d values	Weights	Weighte d values	Weights	Weighte d values	Weights	Weighte d values	Weights	Weighte d values	Weights	Weighte d values	Weights	Weighte d values	Weights	Weighte d values	Weights	Weighte d values	Weights	Weighte d values	Weights	Total weighted val evaluation items i subject
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				on items in the subject	on items	on items in the subject	evaluati on items	in the subject	on items	on items in the subject	on items	on items in the subject	evaluati on items	on items in the subject	evaluati on items	on items in the subject	on items	on items in the subject	evaluati on items	on items in the subject		on items in the subject	evaluati on items	on items in the subject	evaluati on items	Tota
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					23	•	25												2.5		100
Liberal Arts Education	Area Courses	8	1st grade		1																					100
Liberal Arts Education	Basic English Usage I	1	1st grade															100	1							100
Liberal Arts Education		1	1st grade															100	1							100
Liberal Arts Education		1	1st grade															100	1							100
Liberal Arts Education		1	1st grade															100	1							100
Liberal Arts Education		1	1st grade															100	1							100
Liberal Arts Education		1	1st grade															100	1							100
Liberal Arts Education		1	2nd grade															100	1							100
Liberal Arts Education		1	2nd grade															100	1							100
Liberal Arts Education		1	2nd grade															100	1							100
Liberal Arts Education	Basic Foreign Languages I	2	1st grade															100	1							100
Liberal Arts Education		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	0	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		2	1st grade							50 50	1	50	1													100
Liberal Arts Education		2	1st grade 1st grade							50	1	50 50	1													100
Specialized Education	Discrete Mathematics I	2	1st grade							50	1	50	1													100
Specialized Education	Discrete Mathematics 1	2	1st grade							50	1	50	1													100
Specialized Education	Programming I	2	1st grade							50	1	50	1													100
Specialized Education		2	1st grade							50	1	50	1													100
Specialized Education		2	2nd grade							50	1	50	1													100
Specialized Education		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		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
 	Stochastic Modeling	2	2nd grade											100	1											100
	Numerical Computation	2	2nd grade																			100	1			100
	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		100	1																	100
Specialized Education Specialized Education	Multivariate Analysis Basic and practice in Categorical data analysis	2	2nd grade			100	1													100	1					100
Specialized Education Specialized Education	Basic and practice in Categorical data analysis Computer Architecture	2	2nd grade 2nd grade													100	1			100	1					100
Specialized Education	Operating Systems	2	2nd grade 2nd grade													100	1									100
	Databases	2	2nd grade					100	1							100										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					1										100	1							100
Specialized Education	,	1	3rd grade															100	1							100
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				Evaluation items														<u>_</u>								
İ						ge and				/41				and Sl		(4)	. 10	(4)	CO			sive Al				lues of in the
Specialized Education		1	2-44-	(1)	C1	(2)	DI	(3)	I1	33) A 1	33) B 1	(3)	D2	34	I3	(1)	C2	(2)	D3	(3)	I2	(4) E	· 60 · · ·
		1	3rd grade								1	33													-	100
Specialized Education		1	3rd grade			24	-			33			1			34	1					-				100
Specialized Education	Informatics and data science,	1	3rd grade			34	1			33	1	33	1									-			-	100
Specialized Education		1	3rd grade			34	1			33	1	33	1												₩	100
Specialized Education	Theory of Computing	2	3rd grade					50	1	50	1					400									₩	100
Specialized Education	Image Processing	2	3rd grade													100	1									100
Specialized Education	Visual Computing	2	3rd grade													100	1					<u> </u>				100
Specialized Education	Artificial Intelligence and Machine Learning	2	3rd grade					100	1													<u> </u>			—	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		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		1	4th grade			33	1							33	1					34	1					100
Specialized Education		1	4th grade			33	1							33	1					34	1					100
Specialized Education		1	4th grade					33	1							33	1					34	1			100
Specialized Education		1	4th grade					33	1							33	1					34	1			100
Specialized Education	Graduation thesis	3	4th grade											50	1									50	1	100

Sheet 4

Curriculum Map of Informatics and Data Science Program

	Academic Achievement		grade		grade	3rd	grade	4th s	grade
			1	,	ī				1
	Evaluation Itemas	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall
	(1) C1. Knowledge and	(1T)Introduction to University Education							
	capabilities required for solving problems, while understanding	(1T)Introductory Seminar for First-Year Students							
	that various problems of human	(1T)Area courses							
	beings, societies, and individuals	(1T)Health and Sports Courses							
Sol		(2T)Peace Science Courses							
Understandings	ways according social conditions,								
an a	cultures, etc.								
TS.	(2) D1. Knowledge and skills		(4T)Fundamentals of Probability Theory	(1T)Inferential Statistics	(3T)Multivariate Analysis	(1T)Data Mining	(3T)Informatics and data science, Exercise	(1T)Data Science Seminar I	
- John	required for understanding the			(2T)Statistical Test ◎		(2T)Nonparametric analysis	(4T)Informatics and data science, Exercise	(2TData Science Seminar	
						(2T)Behaviormetrics			
and	and efficiently analyzing								
Knowledge	information in big data.								
l v	(3) I1.Knowledge and ability			(1T)Theory of Automata and Languages	(4T)Databases	(1T)Theory of Computing	(3T)Artificial Intelligence and Machine Learning	(1T)Informatics Seminar	
lou	required for collecting and			(1T)Information Theory		(2T)Natural Language Processing		(2T)Informatics Seminar	
×	processing high-dimensional data using information processing			(3T)Differential Equations (○)					
	technologies based on scientific			(2T)Fourier Analysis (○)					
	logic, while understanding the								
	theoretical system that forms the								
	basis of informatics.								
	(1) A Skills related to the	Programming	(3T)Seminar in Mathematics	Programming	Programming	(1T)Informatics and data science, Exercise I	(3T)Informatics and data science, Exercise		
	(1) A. Skills related to the development of an information	(1T)Elements of Calculus	(4T)Seminar in Mathematics	(1T)Theory of Automata and Languages	(3T)Digital Circuit Design	(1T)Theory of Computing	(4T)Informatics and data science, Exercise		
	infrastructure, information	(1T)Introductory Seminar for First-Year Students	Programming	(1T)Inferential Statistics	(3T)Algorithms and Data Structures	(1T)Data Mining	(4T)Computer Network		
	processing techniques, and	(2T)Statistical Data Analysis	(3T)Calculus	(2T)Statistical Test ©	(4T)Programming Languages	(ZT)Informatics and data science, Exercise	(4T)Big Data		
	technology for producing new	(2T)Calculus	(3T)Linear Algebra			(2T)Nonparametric analysis			
	added value through data	(2T)Linear Algebra	(3T)Discrete MathematicsII						
	analysis.	(2T)Discrete MathematicsI	(4T)Fundamentals of Probability Theory						
		P (D.	D. C.				
		Programming	(3T)Seminar in Mathematics	Programming	Programming	(1T)Informatics and data science, Exercise	(3T)Informatics and data science, Exercise		
	(2) B. Ability to identify and solve	(1T)Elements of Calculus	(4T)Seminar in Mathematics	(1T)Theory of Automata and Languages	(3T)Digital Circuit Design	(2T)Informatics and data science, Exercise	(4T)Informatics and data science, Exercise		
Skill	new problems on their own by	(1T)Introductory Seminar for First-Year Students	Programming	(1T)Inferential Statistics	(3T)Algorithms and Data Structures				
		(2T)Statistical Data Analysis	(3T)Calculus	(2T)Statistical Test ©	(4T)Programming Languages				
and	based on data, diverse perspectives, and advanced skills	(2T)Calculus	(3T)Linear Algebra	Model					
S	for information processing and	(2T)Linear Algebra	(3T)Discrete MathematicsII	ividuei					
Abilities	analysis.	· · ·	(,						
J.id		(2T)Discrete MathematicsI	(4T)Fundamentals of Probability Theory						
	(3) D2. Ability to develop				(3T)Generalized Linear Model	(1T)Survey design	(3T)Time Series Analysis	(1T)Data Science Seminar	
	strategies and plans for an				(4T)Stochastic Modeling		(41) Data Analysis for Medical and Welfare Policies	(2T)Data Science Seminar (2T)Data Science Seminar	
ı	per accesses and plans for all		_		(41)Stochastic Modellig	(2T)Education Policy and Data Analysis $ \triangle \Delta $	(41)Data Analysis for Medical and Welfare Policies	(£1)Data Science Seminar	

Academic Achievement	1st g	grade	2nd g	grade	3rd g	grade	4th grade			
Evaluation Itemas			Spring	Fall	Spring	Fall	Spring	Fall		

