Appended Form 1

Specifications for Major Program

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
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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)

Year in Which the Subject is Taken (*The lower figure means semester) (Note 1)

Subject Type	Required No. of Credits	Class Subjects, etc.	No. of Credits	Type of Course Registration	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
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	◎															
Basic Courses in University Education — Introductory Seminar for First-Year Students	2	Introductory Seminar for First-Year Students	2	Required	◎															
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		◎														
Foreign Languages — English — Basic English Usage		Basic English UsageII	1	Required			◎													
Foreign Languages — English — Communication I	2	Communication I A	1	Required		◎														
Foreign Languages — English — Communication I		Communication I B	1	Required		◎														
Foreign Languages — English — Communication II	2	Communication II A	1	Required			◎													
Foreign Languages — English — Communication II		Communication II B	1	Required			◎													
Foreign Languages — English — Communication III	2	CommunicationⅢA	1	Compulsory elective					○		○									
Foreign Languages — English — Communication III		Communication Ⅲ B	1	Compulsory elective					○		○									
Foreign Languages — English — Communication III		Communication ⅢC	1	Compulsory elective					○		○									
Select two subjects from the three subjects above																				
Foreign Languages — 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	○															
Basic Subjects		Seminar in Basic Mathematics I (Note4)	1	Compulsory elective	○															
Basic Subjects		Seminar in Basic Mathematics Ⅱ (Note4)	1				○													
Basic Subjects		Statistical Data Analysis	2	Required	◎															
Basic Subjects		CalculusI	2	Required		◎														
Basic Subjects		CalculusⅡ	2	Required			◎													
Basic Subjects		Linear Algebra I	2	Required		◎														
Basic Subjects		Linear AlgebraⅡ	2	Required			◎													
No. of Credits Required for Graduation	38																			

(Left-hand merged labels: Liberal Arts Education Subjects → Common Subjects)

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."

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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.

Relationships between the Evaluation Items and Class Subjects

Subject Type	Class Subjects	Credits	Period	(1) C1		(2) D1		(3) I1		(1) A		(2) B		(3) D2		(4) I3		(1) C2		(2) D3		(3) I2		(4) E		Total weighted values of evaluation items in the subject
				Knowledge and Understanding						*Abilities and Skills*								*Comprehensive Abilities*								
Liberal Arts Education	Introduction to University Education	2	1semester–1T	100	1																				100
Liberal Arts Education	Introductory Seminar for First-Year Students	2	1semester–1T	25	1					25	1	25	1											25	1	100
Liberal Arts Education	Peace Science Courses	2	1semester-2T	100	1																				100
Liberal Arts Education	Area Courses	8	1semester–1T	100	1																				100
Liberal Arts Education	Basic English UsageI	1	1semester															100	1							100
Liberal Arts Education	Basic English Usage II	1	2semester															100	1							100
Liberal Arts Education	Communication I A	1	1semester															100	1							100
Liberal Arts Education	Communication I B	1	1semester															100	1							100
Liberal Arts Education	Communication II A	1	2semester															100	1							100
Liberal Arts Education	Communication II B	1	2semester															100	1							100
Liberal Arts Education	CommunicationIII A	1	3semester															100	1							100
Liberal Arts Education	CommunicationIII B	1	3semester															100	1							100
Liberal Arts Education	CommunicationIII C	1	3semester															100	1							100
Liberal Arts Education	Basic Foreign LanguagesI	2	1semester															100	1							100
Liberal Arts Education	Health and Sports Subject	2	1semester	100	1																				100
Liberal Arts Education	Elements of Calculus	2	1semester–1T							50	1	50	1													100
Liberal Arts Education	Seminar in Basic Mathematics I	1	1semester							50	1	50	1													100
Liberal Arts Education	Seminar in Basic Mathematics II	1	2semester							50	1	50	1													100
Liberal Arts Education	Statistical Data Analysis	2	1semester–1T							50	1	50	1													100
Liberal Arts Education	CalculusI	2	1semester-2T							50	1	50	1													100
Liberal Arts Education	CalculusI II	2	2semester–1T							50	1	50	1													100
Liberal Arts Education	Linear Algebra I	2	1semester-2T							50	1	50	1													100
Liberal Arts Education	Linear Algebra II	2	2semester–1T							50	1	50	1													100
Specialized Education	Discrete Mathematics I	2	1semester-2T							50	1	50	1													100
Specialized Education	Discrete Mathematics II	2	1semester-3T							50	1	50	1													100
Specialized Education	Programming I	2	1semester							50	1	50	1													100
Specialized Education	Programming II	2	2semester							50	1	50	1													100
Specialized Education	Programming III	2	3semester							50	1	50	1													100
Specialized Education	Programming IV	2	4semester							50	1	50	1													100
Specialized Education	Theory of Automata and Languages	2	2semester–1T					34	1	33	1	33	1													100
Specialized Education	Digital Circuit Design	2	2semester-3T							33	1	33	1			34	1									100
Specialized Education	Programming Languages	2	2semester-4T							33	1	33	1			34	1									100
Specialized Education	Algorithms and Data Structures	2	2semester-3T							33	1	33	1									34	1			100
Specialized Education	Fundamentals of Probability Theory	2	1semester-4T			34	1			33	1	33	1													100
Specialized Education	Inferential Statistics	2	2semester–1T			34	1			33	1	33	1													100
Specialized Education	Linear Regression Model	2	2semester-2T			34	1			33	1	33	1													100
Specialized Education	Statistical Test	2	2semester–1T			34	1			33	1	33	1													100
Specialized Education	Generalized Linear Model	2	2semester-3T											100	1											100
Specialized Education	Stochastic Modeling	2	2semester-4T											100	1											100
Specialized Education	Numerical Computation	2	2semester-4T																	100	1					100
Specialized Education	Mathematical Programming	2	3semester																	100	1					100
Specialized Education	System Optimization	2	2semester-3T																	100	1					100
Specialized Education	Differential Equations	2	2semester-2T					100	1																	100
Specialized Education	Fourier Analysis	2	2semester-4T					100	1																	100
Specialized Education	Multivariate Analysis	2	2semester-3T			100	1																			100
Specialized Education	Basic and practice in Categorical data analysis	2	2semester-2T																	100	1					100
Specialized Education	Computer Architecture	2	2semester-4T													100	1									100
Specialized Education	Operating Systems	2	2semester-3T													100	1									100
Specialized Education	Databases	2	2semester-4T					100	1																	100
Specialized Education	Software Engineering	2	2semester-2T																			100	1			100
Specialized Education	Information Theory	2	2semester–1T					100	1																	100
Specialized Education	Practical English I	1	3semester–1T															100	1							100
Specialized Education	Practical English II	1	3semester-3T															100	1							100

	Course	Credits	Semester	Knowledge and Understanding						Abilities and Skills								Comprehensive Abilities								Total
				(1) C1		(2) D1		(3) I1		(1) A		(2) B		(3) D2		(4) I3		(1) C2		(2) D3		(3) I2		(4) E		
Specialized Education	Informatics and data science, Exercise I	1	3semester-1T							33	1	33	1			34	1									100
Specialized Education	Informatics and data science, Exercise II	1	3semester-2T							33	1	33	1			34	1									100
Specialized Education	Informatics and data science, Exercise III	1	3semester-3T			34	1			33	1	33	1													100
Specialized Education	Informatics and data science, Exercise IV	1	3semester-4T			34	1			33	1	33	1													100
Specialized Education	Theory of Computing	2	3semester-1T					50	1	50	1															100
Specialized Education	Image Processing	2	3semester-2T													100	1									100
Specialized Education	Visual Computing	2	3semester-3T													100	1									100
Specialized Education	Artificial Intelligence and Machine Learning	2	3semester-3T					100	1																	100
Specialized Education	Computer Network	2	3semester-4T							50	1					50	1									100
Specialized Education	Human Computer Interaction	2	3semester-3T													100	1									100
Specialized Education	Parallel and Distributed Processing	2	3semester-3T													100	1									100
Specialized Education	Software Management	2	3semester-2T																			100	1			100
Specialized Education	Natural Language Processing	2	3semester-2T					100	1																	100
Specialized Education	Information Society and Security	2	3semester-2T																			100	1			100
Specialized Education	Data Mining	2	3semester-1T			50	1			50	1															100
Specialized Education	Survey design	2	3semester-1T											100	1											100
Specialized Education	Nonparametric analysis	2	3semester-2T			50	1			50	1															100
Specialized Education	Big Data	2	3semester-4T							50	1									50	1					100
Specialized Education	Behaviormetrics	2	3semester-2T			100	1																			100
Specialized Education	Econometrics	2	3semester-2T																	100	1					100
Specialized Education	Time Series Analysis	2	3semester-3T											100	1											100
Specialized Education	Biostatistics	2	3semester-2T																	100	1					100
Specialized Education	Biomedical Statistics	2	3semester-3T																	100	1					100
Specialized Education	Stochastic Processes	2	3semester-4T																	100	1					100
Specialized Education	Financial Engineering	2	3semester-4T																	100	1					100
Specialized Education	Data Analysis for Medical and Welfare Policies	2	3semester-4T											100	1											100
Specialized Education	Society and Data Analysis	2	3semester-3T																	100	1					100
Specialized Education	Total Quality Management and Data Analysis	2	3semester-2T																	100	1					100
Specialized Education	Education Policy and Data Analysis	2	3semester-4T											100	1											100
Specialized Education	Data Science Seminar I	1	4semester-1T			33	1			33	1									34	1					100
Specialized Education	Data Science Seminar II	1	4semester-2T			33	1			33	1									34	1					100
Specialized Education	Informatics Seminar I	1	4semester-1T					33	1							33	1					34	1			100
Specialized Education	Informatics Seminar II	1	4semester-2T					33	1							33	1					34	1			100
Specialized Education	Graduation thesis	3	8 semester											50	1									50	1	100

Curriculum Map of Informatics and Data Science Program

Academic Achievement / Evaluation Itemas	1st year Spring	1st year Fall	2nd year Spring	2nd year Fall	3rd year Spring	3rd year Fall	4th year Spring	4th year Fall
Knowledge and Understandings (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.	(1T)Introduction to University Education; (1T)Introductory Seminar for First-Year Students; (1T)Area courses; (1T)Health and Sports Courses; (2T)Peace Science Courses							
(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.		(4T)Fundamentals of Probability Theory	(1T)Inferential Statistics; (1T)Statistical Test; (2T)Linear Regression Model	(3T)Multivariate Analysis	(1T)Data Mining; (2T)Nonparametric analysis; (2T)Behaviormetrics	(3T)Informatics and data science, Exercise; (4T)Informatics and data science, Exercise	(1T)Data Science Seminar I; (2T)Data Science Seminar	
(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			(1T)Theory of Automata and Languages; (1T)Information Theory; (2T)Differential Equations	(4T)Fourier Analysis; (4T)Databases	(1T)Theory of Computing; (2T)Natural Language Processing	(3T)Artificial Intelligence and Machine Learning	(1T)Informatics Seminar; (2T)Informatics Seminar	
Abilities and 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.	Seminar in Mathematics; Programming; (1T)Elements of Calculus; (1T)Introductory Seminar for First-Year Students; (1T)Statistical Data Analysis; (2T)Calculus; (2T)Linear Algebra; (2T)Discrete MathematicsI	Seminar in Mathematics; Programming; (3T)Calculus; (3T)Linear Algebra; (3T)Discrete MathematicsII; (4T)Fundamentals of Probability Theory	Programming; (1T)Theory of Automata and Languages; (1T)Inferential Statistics; (1T)Statistical Test; (2T)Linear Regression Model	Programming; (3T)Digital Circuit Design; (3T)Algorithms and Data Structures; (4T)Programming Languages	(1T)Informatics and data science, Exercise I; (1T)Theory of Computing; (2T)Informatics and data science, Exercise; (2T)Nonparametric analysis; (1T)Data Mining	(3T)Informatics and data science, Exercise; (4T)Informatics and data science, Exercise; (4T)Computer Network; (4T)Big Data		
(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.	Seminar in Mathematics; Programming; (1T)Elements of Calculus; (1T)Introductory Seminar for First-Year Students; (1T)Statistical Data Analysis; (2T)Calculus; (2T)Linear Algebra; (2T)Discrete MathematicsI	Seminar in Mathematics; Programming; (3T)Calculus; (3T)Linear Algebra; (3T)Discrete MathematicsII; (4T)Fundamentals of Probability Theory	Programming; (1T)Theory of Automata and Languages; (1T)Inferential Statistics; (1T)Statistical Test; (2T)Linear Regression Model	Programming; (3T)Digital Circuit Design; (3T)Algorithms and Data Structures; (4T)Programming Languages	(1T)Informatics and data science, Exercise; (2T)Informatics and data science, Exercise	(3T)Informatics and data science, Exercise; (4T)Informatics and data science, Exercise		
(3) D2. Ability to develop strategies and plans for an organization based on statistical				(3T)Generalized Linear Model; (4T)Stochastic Modeling	(1T)Survey design	(3T)Time Series Analysis; (4T)Data Analysis for Medical and Welfare Policies; (4T)Education Policy and Data Analysis	(1T)Data Science Seminar; (2T)Data Science Seminar	

evidence by using a wide range of knowledge and skills related to data science.								
(4) I3. Knowledge related to hardware and software, and the programming skills required for efficiently processing data.				(3T)Digital Circuit Design (3T)Operating Systems (4T)Programming Languages (4T)Computer Architecture	(1T)Informatics and data science, Exercise (2T)Informatics and data science, Exercise (2T)Image Processing	(3T)Visual Computing (3T)Human Computer Interaction (3T)Parallel and Distributed Processing (4T)Computer Network	(1T)Informatics Seminar (2T)Informatics Seminar	
(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.	Basic English Usage Communication Communication Basic Foreign Languages	Basic English Usage Communication Communication	Communication Communication Communication		(1T)Practical English I	(3T)Practical English		Graduation Thesis
(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.			(2T)Basic and practice in Categorical data analysis		(2T)Econometrics (2T)Biostatistics	(3T)Biomedical Statistics (3T)Society and Data Analysis (3T)Total Quality Management and Data Analysis (4T)Big Data (4T)Stochastic Processes (4T)Financial Engineering	(1T)Data Science Seminar (2T)Data Science Seminar	
(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.			Mathematical Programming (2T)Software Engineering	(3T)Algorithms and Data Structures (3T)System Optimization (4T)Numerical Computation	(2T)Software Management (2T)Information Society and Security		(1T)Informatics Seminar (2T)Informatics Seminar	
(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.	(1T)Introductory Seminar for First-Year Students							Graduation Thesis

(Rows C2 through E are grouped under the rotated side label **Comprehensive Abilities**.)

Ex   Liberal Arts Education   Specialized Core Subjects   Specialized Subjects   Graduation Thesis

Type of course registration in parenthesis is as Data Science and Informatics