

C.2.2: Computer Science Draft Competencies										Inventing		D-11																		
Code	Field	Key	Title (En)	Title (Ja)	Statement (En)	Statement (Ja)	Computing Knowledge Areas										English Language Knowledge Areas		Liberal Arts Knowledge Areas		Fundational and Professional Knowledge		Disposition							
							AL-Algorithms and Complexity										Sociocultural Awareness		English Language Knowledge Areas		Liberal Arts Knowledge Areas		Fundational and Professional Knowledge							
C-AL-001	AL	A	Estimating Computational Complexity	アルゴリズムと複雑性の評価	Present to a group of peers the data characteristics of conditions or assumptions that can lead to different behaviors of specific algorithms and from the analysis, illustrate empirical studies to validate hypotheses about runtime measures.	アルゴリズムと複雑性の評価	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Semiprivate networks	K(E-22)	Socially just behavior	K(L-31)	Relationship Management	K(P-2)								
C-AL-002-1	AL	B			Illustrate informally the time and space complexity of algorithms and use big-O notation formally to show asymptotic upper bounds and expected case bounds on time and space complexity, respectively.	アルゴリズムと複雑性の評価	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Orthographic control	K(E-16)	社会的不適切な表現	K(L-21)	Multi-task Presentation and Management	K(P-7)								
C-AL-002-2	AL	B			Illustrate informally the time and space complexity of algorithms and use big-O notation formally to show asymptotic upper bounds and expected case bounds on time and space complexity, respectively.	アルゴリズムと複雑性の評価	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Phonological control	K(E-15)	社会的不適切な表現	K(L-21)	Research and Self-Study/Learner	K(P-6)								
C-AL-003-1	AL	C			Illustrate informally the time and space complexity of algorithms and use big-O notation formally to show asymptotic upper bounds and expected case bounds on time and space complexity, respectively.	アルゴリズムと複雑性の評価	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Vocabulary control	K(E-14)	社会的不適切な表現	K(L-21)	Problem Solving and Troubleshooting	K(P-2)								
C-AL-003-2	AL	C			Illustrate informally the time and space complexity of algorithms and use big-O notation formally to show asymptotic upper bounds and expected case bounds on time and space complexity, respectively.	アルゴリズムと複雑性の評価	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	General linguistic ability	K(E-11)	社会的不適切な表現	K(L-21)	Project and Task Organization Planning	K(P-4)								
C-AL-004-1	AL	D			Use recurrence relations to determine the time complexity of recursively defined algorithms by solving elementary recurrence relations and present the results to a group of scholars.	アルゴリズムと複雑性の評価	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Signal processing	K(C-64)	社会的不適切な表現	K(L-21)	Written Communication	K(P-1)								
C-AL-004-3	AL	D			Use recurrence relations to determine the time complexity of recursively defined algorithms by solving elementary recurrence relations and present the results to a group of scholars.	アルゴリズムと複雑性の評価	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Turn-taking	K(E-22)	社会的不適切な表現	K(L-21)	Oral Communication and Presentation	K(P-3)								
C-AL-004-4	AL	D			Use recurrence relations to determine the time complexity of recursively defined algorithms by solving elementary recurrence relations and present the results to a group of scholars.	アルゴリズムと複雑性の評価	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Proposed solution	K(E-25)	社会的不適切な表現	K(L-21)	Problem Solving and Troubleshooting	K(P-2)								
C-AL-004-5	AL	D			Use recurrence relations to determine the time complexity of recursively defined algorithms by solving elementary recurrence relations and present the results to a group of scholars.	アルゴリズムと複雑性の評価	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Conference attendance	K(E-4)	社会的不適切な表現	K(L-21)	Time Management	K(P-10)								
C-AL-004-6	AL	D			Use recurrence relations to determine the time complexity of recursively defined algorithms by solving elementary recurrence relations and present the results to a group of scholars.	アルゴリズムと複雑性の評価	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Thematic development	K(E-33)	社会的不適切な表現	K(L-21)	Professional	D-5								
C-AL-005-1	AL	E	Choice of an Appropriate Algorithm	適切なアルゴリズムの選択	Determine an appropriate algorithmic approach to an industry problem and use appropriate techniques (e.g., greedy approach, divide-and-conquer algorithm, recursive backtracking, dynamic programming, or heuristic approach) that consider the tradeoffs between the brute force to solve a problem.	アルゴリズムと複雑性の評価	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Computational accuracy	K(E-13)	社会的不適切な表現	K(L-21)	Relationship Management	K(P-2)								
C-AL-005-4	AL	E			Determine an appropriate algorithmic approach to an industry problem and use appropriate techniques (e.g., greedy approach, divide-and-conquer algorithm, recursive backtracking, dynamic programming, or heuristic approach) that considers the tradeoffs between the brute force to solve a problem.	アルゴリズムと複雑性の評価	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Architectural and Organizational	K(C-61)	社会的不適切な表現	K(L-21)	Multi-task Presentation and Management	K(P-7)								
C-AL-005-5	AL	E			Determine an appropriate algorithmic approach to an industry problem and use appropriate techniques (e.g., greedy approach, divide-and-conquer algorithm, recursive backtracking, dynamic programming, or heuristic approach) that considers the tradeoffs between the brute force to solve a problem.	アルゴリズムと複雑性の評価	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Computing Systems Fundamentals	K(C-5)	社会的不適切な表現	K(L-21)	Research and Self-Study/Learner	K(P-6)								
C-AL-005-2	AL	E			Determine an appropriate algorithmic approach to an industry problem and use appropriate techniques (e.g., greedy approach, divide-and-conquer algorithm, recursive backtracking, dynamic programming, or heuristic approach) that considers the tradeoffs between the brute force to solve a problem.	アルゴリズムと複雑性の評価	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Programming and Debugging	K(C-4)	社会的不適切な表現	K(L-21)	Problem Solving and Troubleshooting	K(P-2)								
C-AL-005-3	AL	E			Determine an appropriate algorithmic approach to an industry problem and use appropriate techniques (e.g., greedy approach, divide-and-conquer algorithm, recursive backtracking, dynamic programming, or heuristic approach) that considers the tradeoffs between the brute force to solve a problem.	アルゴリズムと複雑性の評価	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Computing Systems Fundamentals	K(C-5)	社会的不適切な表現	K(L-21)	Project and Task Organization Planning	K(P-4)								
C-AL-010	AL	J			Implement basic numerical algorithm methods (e.g., search algorithms common quadratic and $O(N \log N)$ sorting algorithms, fundamental graph algorithms, string-matching algorithm) to solve an industry problem and select the appropriate algorithm for a particular context.	アルゴリズムと複雑性の評価	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Data Structures, Algorithms, and Complexity	K(C-5,3)	社会的不適切な表現	K(L-21)	Written Communication	K(P-1)								
C-AL-006-1	AL	F			Implement basic numerical algorithm methods (e.g., search algorithms common quadratic and $O(N \log N)$ sorting algorithms, fundamental graph algorithms, string-matching algorithm) to solve an industry problem and select the appropriate algorithm for a particular context.	アルゴリズムと複雑性の評価	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Software Engineering	K(C-3)	社会的不適切な表現	K(L-21)	Oral Communication and Presentation	K(P-3)								
C-AL-006-2	AL	F			Implement basic numerical algorithm methods (e.g., search algorithms common quadratic and $O(N \log N)$ sorting algorithms, fundamental graph algorithms, string-matching algorithm) to solve an industry problem and select the appropriate algorithm for a particular context.	アルゴリズムと複雑性の評価	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Software Engineering	K(C-3)	社会的不適切な表現	K(L-21)	Problem Solving and Troubleshooting	K(P-2)								
C-AL-007	AL	G			Design a deterministic finite state machine for a local engineering firm that accepts a specified language and generates a regular expression to represent the language.	アルゴリズムと複雑性の評価	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Computing Systems Fundamentals	K(C-5)	社会的不適切な表現	K(L-21)	Relationship Management	K(P-2)								
C-AL-008	AL	H	Fundamentals of Mathematical Modeling	数学的モデル化の基礎	Understand what kind of computational methods can be applied to solve problems in fundamental concepts of mathematics and physics, e.g., calculus, algebra, probability/statistics, differential equations.	アルゴリズムと複雑性の評価	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Software Quality, Verification and Validation	K(C-4,1)	社会的不適切な表現	K(L-21)	Relationship Management	K(P-2)								
C-AL-009	AL	I			Demonstrate how to write computer programs to solve problems in fundamental concepts of mathematics and physics and understand practical computational efficiency.	アルゴリズムと複雑性の評価	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Platform Technologies	K(C-3,2)	社会的不適切な表現	K(L-21)	Written Communication	K(P-1)								
AR-Architecture and Organization										論理設計のためのCADツールの利用																				
C-AR-001	AR	A	Use of CAD tools for logic designs	CADツールによる論理回路設計	Using CAD tools to design and simulate combinational and sequential circuits.	論理設計のためのCADツールの利用	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Virtual Systems and Services	K(C-3,1)	組み合わせ回路や順序回路を設計、およびシミュレーションするためのCADツールの利用	B-II	Relationship Management	K(P-2)								
C-AR-002	AR	B			Evaluate the timing diagram behavior of a simple processor-implemented at the logic circuit level and develop a report expressing the findings.	論理設計のためのCADツールの利用	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Integrated System Technology	K(C-3,7)	組み合わせ回路や順序回路の時刻学的性質を評価する	B-II	Relationship Management	K(P-2)								
C-AR-003	AR	C			Write a simple program at the assembly/machine level for string processing and manipulation and for converting numerical data into hexadecimal form.	論理設計のためのCADツールの利用	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Implementation	K(C-3,6)	組み合わせ回路や順序回路の時刻学的性質を評価する	B-II	Relationship Management	K(P-2)								
C-AR-004	AR	D			Implement a fundamental high-level construct in both machine and assembly languages and present the results to a group of peers.	論理設計のためのCADツールの利用	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	System Analysis and Design	K(C-2,2)	組み合わせ回路や順序回路の時刻学的性質を評価する	B-II	Relationship Management	K(P-2)								
C-AR-005	AR	E			Calculate the average memory access time under a variety of cache and memory configurations and develop a short report of the findings.	論理設計のためのCADツールの利用	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Probability	K(E-31)	Processor Management	K(C-3,4)	組み合わせ回路や順序回路の時刻学的性質を評価する	B-II	Relationship Management	K(P-2)								
C-AR-006	AR	F	Electronics	デジタルLSI回路の設計と評価	Design electric and electronic circuits using passive and active devices and measure their performances.	論理設計のためのCADツールの利用	Probability	K(E-31)	Probability																					

C.2.2: Computer Science Draft Competencies										Disposition	
Code	Field	Key	Title (En)	Title (Ja)	Statement (En)	Statement (Ja)	English Language Knowledge Areas				Functional and Professional Knowledge
							Social and Ethical Perspectives	Mathematics and Statistics	Metacognition	Disposition	
C-AR-011	AR	K			Model a counter using Verilog HDL and synthesize the Verilog HDL model to generate the logic circuit of the counter. Implement the synthesized logic circuit on a Field Programmable Gate Array (FPGA) on an evaluation board with the design of a 7 segment LED controller.						
C-AR-012	AR	L	Two-level logic design and optimization	二段論理設計と最適化	Generation of two-level logic functions from given truth tables. Optimization of the two-level logic functions using Karnaugh maps.	与えられた真理値表からの二段論理関数の生成。カルノマップを使用した二段論理関数の最適化。					
C-AR-013	AR	M	Performance analysis and optimization for logic circuits	論理回路に対する性能解析と最適化	Understanding gate delays on logic circuits. Performance analysis for logic circuits using the delays. Performance optimization of logic circuits considering the worst-case delay.	論理回路におけるゲート遅延の理解。遅延を用いた論理回路の性能評価。最悪状況を考慮した論理回路の性能最適化。					
C-AR-014	AR	N	Sequential circuit designs	順序回路設計	Designing finite state machines (FSMs) for sequential circuits. Design sequential circuits from the designed FSMs.	順序回路のための有限状態マシンの設計。設計した有限状態マシンからの順序回路設計。					
C-AR-015	AR	O			Understand the features and functions of typical components of computer systems, as well as configure them and understand system configuration with good performance according to the characteristics of the system.						
C-AR-016	AR	P			Understand the behavior of semiconductor devices such as intrinsic semiconductor, extrinsic semiconductor, MOS transistors, CMOS circuits, and semiconductor photodevices.						
C-AR-017	AR	R			Understand differences between Real-Time OS (RTOS) and high-performance OS (Windows, Macos, Linux, etc.), and understand various functions of RTOS (semaphores, task management, etc.)						
C-AR-018	AR	S			Use an Electronic Design Automation (EDA) tool to design the interconnects to peripheral devices.						
C-AR-019	AR	T			Understand the characteristics of task design methods and typical scheduling algorithms in embedded systems, and learn the basics of embedded system design.						
CN:Computational Science											
C-CN-001-1	CN	A			Create a simple, formal mathematical model of a real-world situation and use that model in a simulation for a local technology company.						
C-CN-001-2	CN	A			Create a simple, formal mathematical model of a real-world situation and use that model in a simulation for a local technology company.						
C-CN-002	CN	B	Understanding Application of Computers	コンピュータの応用の理解	Understand computer theory.	コンピュータの理論について理解する。					
DS:Discrete Structures											
C-DS-001-1	DS	A	set theory		Present to a peer group some practical examples of an appropriate set, function, or relation model, and interpret the associated operations and terminology in context.	適切な集合、関数、関係モデルの実例を示し、関連する作用や用語を文脈に沿って解説できる。					
C-DS-001-2	DS	A			Present to a peer group some practical examples of an appropriate set, function, or relation model, and interpret the associated operations and terminology in context.						
C-DS-001-3	DS	A			Present to a peer group some practical examples of an appropriate set, function, or relation model, and interpret the associated operations and terminology in context.						
C-DS-002-1	DS	B	algebra		Use symbolic propositional and predicate logic to model a real-life industry application by applying formal methods (e.g., calculating the validity of formulas and computing normal forms to the symbolic logic).	現実の実社会への応用を目標に、記号論理演算と述語論理を使用して、形式的手法（記号論理に対する式の妥当性の計算や正規形の計算など）を適用できる。					
C-DS-002-2	DS	B			Use symbolic propositional and predicate logic to model a real-life industry application by applying formal methods (e.g., calculating the validity of formulas and computing normal forms to the symbolic logic).						
C-DS-003	DS	C			Apply rules of inference to construct proofs and present results to a group of professionals, appropriate proofs, or logical reasoning to solve a strategic problem.						
C-DS-004	DS	D			Map real-world applications to appropriate counting formalisms and apply basic counting theories (e.g., counting arguments, the pigeonhole principle, modular arithmetic as well as compute permutations and combinations of a set) to solve an industry problem.						
C-DS-005	DS	E			Analyze an industry problem to determine underlying recurrence relations and present the solution to professionals by using a variety of basic recurrence relations.						
C-DS-006-1	DS	F			Model a real-world problem using appropriate graphing strategies (e.g., trees, traversal methods for graphs and trees, spanning trees of a graph) and determine whether two graph approaches are isomorphic.						
C-DS-006-2	DS	F			Model a real-world problem using appropriate graphing strategies (e.g., trees, traversal methods for graphs and trees, spanning trees of a graph) and determine whether two graph approaches are isomorphic.						
C-DS-007	DS	G	fundamental calculus		Calculate different probabilities of dependent or independent events and expectations of random variables to solve a problem and present to a group of peers the ways to compute the variance for a given probability distribution.	問題を解くために従属事象または独立事象の異なる確率と確率変数の期待値を計算し、与えられた確率分布に対する分散の計算方法を仲間に発表することができる。					
GV:Graphics and Visualization											
C-GV-001	GV	A			Design and develop a user interface using a standard API and that incorporates visual and audio techniques used for a local organization.						
C-GV-002	GV	A			Design and develop a user interface using a standard API and that incorporates visual and audio techniques used for a local organization.						
C-GV-003	GV	A	Rendering algorithms		Design and develop a user interface using a standard API and that incorporates visual technique used for a local organization.						
C-GV-004	GV	B	Rendering algorithms		Demonstrate understanding and the ability to implement common rendering algorithms.						
C-GV-005	GV	C	Geometric modeling		Demonstrate understanding of the mathematics, data-structures and algorithms for modeling geometric objects by designing and implementing computer programs for creating, manipulating and processing geometric objects.						
C-GV-006	GV	D	Graphics pipeline		Demonstrate understanding and ability to design and implement a full graphics pipeline.						
C-GV-007	GV	E	Graphics API		Demonstrate the ability to design and implement graphics programs using a standard graphics library.						
C-GV-008	GV	F	Understanding Application of Computers	コンピュータの応用の理解	Understand the generation of 3D graphics.	3次元グラフィックスの生成について理解する。					
HCI-Human-Computer Interaction											
C-HI-001	HCI	A			Design an interactive application, applying a user-centered design cycle with related tools and techniques (modes, navigation, visual design), to optimize usability and user experience within a corporate environment.						
C-HI-002	HCI	B			Analyze and evaluate a user interface that considers the context of use, stakeholder needs, state-of-the-art response interaction times, design modalities taking into consideration universal access, inclusiveness, assistive technologies, and culture-sensitive design.						
C-HI-003	HCI	C			Design and develop an interactive application for a local charity, applying a user-centered design cycle with related vocabulary, tools, and techniques that optimize usability and user experience.						
C-HI-004	HCI	D			Create and conduct a simple usability test to analyze and evaluate a user interface that considers the context of use taking into consideration universal access and culturally sensitive design.						
C-HI-005	HCI	E			Create a simple application, together with help and documentation, that supports a graphical user interface for an enterprise and conduct a quantitative evaluation and report the results.						

C.2.2: Computer Science Draft Competencies										Inventing		D-11										
Code	Field	Key	Title (En)	Title (Ja)	Statement (En)	Statement (Ja)																
C-PB-002	PBD	B			Develop a mobile app for a company that is usable, efficient, and secure on more than one device.																	
C-PB-003	PBD	C			Simulate for a company an industry platform.																	
C-PB-004	PBD	D			Develop and implement programming tasks via platform-specific APIs and present the results to a group of peers.																	
C-PB-005	PBD	E			Present the analysis of a mobile industrial system and illustrate correct security vulnerabilities.																	
C-PB-006	PBD	F	Use of a micro-computer board	マイクロコンピュータ基板の使用	Understanding how to use a micro-computer board, sensors, and actuators to implement a simple computer system.	簡単なコンピュータシステムを実現するために、どのようにマイクロコンピュータ基板、センサー、およびアクチュエータを使うのかの理解																
C-PB-007	PBD	G	Development of a computer system using a micro-computer board	マイクロコンピュータ基板を使ったコンピュータシステムの開発	Developing a computer system based on self idea using a micro-computer board, sensors, and actuators.	マイクロコンピュータ基板、センサー、およびアクチュエータを使って、自己のアイデアに基づいたコンピュータシステムを開発																
C-PB-008	PBD	H			Implement and demonstrate various embedded systems, such as stopwatch and image processing, on an FPGA device																	
PD-Parallel and Distributed Computing																						
C-PD-001	PD	A			Design a scalable parallel algorithm for a computer firm by applying task-decomposition or data-paralleled composition.																	
C-PD-002	PD	B			Write a program for a client that correctly terminates when all concurrent tasks terminate by considering actors and/or reactive processes, deadlocks, and properly synchronized queues.																	
C-PD-003	PD	C			Write a test program for a company that reveals a concurrent programming error (e.g., missing an update when two activities both try to increment a variable).																	
C-PD-004	PD	D			Present computational results of the work and span in a program by identifying independent tasks that may be parallelized and determining the critical paths for a parallel execution diagram.																	
C-PD-005	PD	E			Implement a parallel divide-and-conquer (and/or graph algorithm) for a client by mapping and reducing operations for the real industry problem and empirically measure its performance relative to its sequential analog.																	
PL-Programming Languages																						
C-PL-001	PL	A			Present the design and implementation of a class considering object-oriented encapsulation mechanisms (e.g., class hierarchies, interfaces, and private members).																	
C-PL-002	PL	B			Produce a brief report on the implementation of a basic algorithm considering control flow in a program using dynamic dispatch that avoids assigning to a mutable state (or considering reference equality) for two different languages.																	
C-PL-003	PL	C			Present the implementation of a useful function that takes and returns other functions considering variables and lexical scope in a program as well as functional encapsulation mechanisms.																	
C-PL-004	PL	D			Use iterators and other operations on aggregates (including operations that take functions as arguments) in two programming languages and present to a group of professionals some ways of selecting the most natural idioms for each language.																	
C-PL-005	PL	E			Contrast and present to peers (1) the procedural/functional approach (defining a function for each operation with the function body providing a case for each data variant) and (2) the object-oriented approach (defining a class for each data variant with the class definition providing a method for each operation).																	
C-PL-006	PL	F			Write event handlers for a web developer for use in reactive systems such as GUIs.																	
C-PL-007	PL	G			Demonstrate program pieces (such as functions, classes, methods) that use generic or compound types, including for collections to write programs.																	
C-PL-008	PL	H			Write a program for a client to process a representation of code that illustrates the incorporation of an interpreter, an expression optimizer, and a documentation generator.																	
C-PL-009	PL	I			Use type-error messages, memory leaks, and dangling-pointer to debug a program for an engineering firm.																	
C-PL-010	PL	J			Describe how the historical development of hardware and operating system computing platforms produced the computing systems we have today.																	
C-PL-011	PL	K			Produce a block diagram, including interconnections, of the main parts of a computer, and illustrate methods used on a computer for storing and retrieving data.																	
C-PL-012	PL	L	Understanding Computer Languages	コンピュータ言語の理解	Understand the concept of computer languages and their representation in several languages. Understand how computer languages are represented and translated into machine language.	コンピュータ言語の概念やいくつかの言語の表現を理解する。コンピュータ言語がどのように解釈され、機械語に変換されるかを理解する。																
SDF-Software Development Fundamentals																						
C-SD-001	SDF	A			Create an appropriate algorithm to illustrate iterative, recursive functions, as well as divide-and-conquer techniques and use a programming language to implement, test, and debug the algorithm for solving a simple industry problem.																	
C-SD-002	SDF	B			Decompose a program for a client that identifies the data components and behaviors of multiple abstract data types and implementing a coherent abstract data type, with loose coupling between components and behaviors.																	
C-SD-003	SDF	C			Design, implement, test, and debug an industry program that uses fundamental programming constructs including basic computation, simple and file I/O, standard conditional and iterative structures, the definition of functions, and parameter passing.																	
C-SD-004	SDF	D			Present the costs and benefits of dynamic and static data structure implementations, choosing the appropriate data structure for modeling a given engineering problem.																	
C-SD-005	SDF	E			Apply consistent documentation and program style standards for a software engineering company that contribute to the readability and maintainability of software, conducting a personal and small-team code review on program component using a provided checklist.																	
C-SD-006	SDF	F			Demonstrate common coding errors, constructing and debugging programs using the standard libraries available with a chosen programming language.																	
C-SD-007	SDF	G			Refactor an industry program by identifying opportunities to apply procedural abstraction.																	
C-SD-008	SDF	H			Know how to write, compile, and run simple programs with different languages																	
C-SD-009	SDF	I	Understanding Computer Languages	コンピュータ言語の理解	Understand the representation of data structures in computers, basic software development flow and diagrams required for software development.	データ構造のコンピュータ内での表現、基本的なソフトウェア開発の流れとソフトウェア開発に必要な図を理解する。																
SE-Software Engineering																						
C-SE-001	SE	A			Conduct a review of a set of software requirements for a local project, distinguishing between functional and non-functional requirements, and evaluate the extent to which the set exhibits the characteristics of good requirements.																	
C-SE-002	SE	B			Present to a client the design of a simple software system using a modeling notation (such as UML), including an explanation of how the design incorporated system design principles.																	
SF-Systems Fundamentals																						
English Language Knowledge Areas										English Language Knowledge Areas						Liberal Arts Knowledge Areas						
										Functional and Professional Knowledge												

C.2.2- Computer Science Draft Competencies											Disposition		
Code	Field	Key	Title (En)	Title (Ja)	Statement (En)	Statement (Ja)	English Language Knowledge Areas			Liberal Arts Knowledge Areas		Fundational and Professional Knowledge	
							Oral Communication and Presentation	Written Communication	Project and Task Organization and Planning	Relationships and Management	Multi-Task Prioritization and Management	Oral Communication and Presentation	Written Communication
C-SF-001	SF	A			Design a simple sequential problem and a parallel version of the same problem using fundamental building blocks of logic design and use appropriate tools to evaluate the design for a commercial organization and evaluate both problem versions.		K(F-3.4)	K(L-3.4)	K(P-10)	K(P-11)	K(P-12)		
C-SF-002	SF	B			Develop a program for a local organization that incorporated error detection and recovery that incorporates appropriate tools for program tracing and debugging.		K(F-3.5)	K(L-3.5)	K(P-9)	K(P-8)	K(P-7)		
C-SF-003	SF	C			Design a simple parallel program for a corporation that manages shared resources through synchronization primitives and use tools to evaluate program performance.		K(L-3.2)	K(L-3.1)					
C-SF-004	SF	D			Design and conduct a performance-oriented, pattern recognition experiment incorporating state machine descriptors and simple schedule algorithms for exploiting redundant information and data correction that is usable for a local engineering company and use appropriate tools to measure program performance.		K(L-2.2)	K(L-2.1)					
C-SF-005	SF	E			Calculate average memory access time and describe the tradeoffs in memory hierarchy in terms of capacity, miss/hit rate, and access time for a local engineering company.		K(L-1.5)	K(L-1.4)					
C-SF-006	SF	F			Measure the performance of two application instances running on separate virtual machines at a local engineering company and determine the effect of performance isolation.		K(L-1.2)	K(L-1.1)					
SP-Social Issues and Professional Practice													
C-SP-001	SP	A			Perform a system analysis for a local organization and present the results to them in a non-technical way.		K(F-3.5)	K(E-3.5)					
C-SP-002	SP	B			Integrate interdisciplinary knowledge to develop a program for a local organization.		K(E-3.4)	K(E-3.3)					
C-SP-003	SP	C			Document industry trends, innovations, and new technologies and produce a report to influence a targeted workspace.		K(E-3.3)	K(E-3.3)					
C-SP-004	SP	D			Present to a group of professionals an innovative computer system by using audience-specific language and examples to illustrate the group's needs.		K(E-3.2)	K(E-3.1)					
C-SP-005	SP	E			Produce a document that is helpful to others that addresses the effect of societal change due to technology.		K(E-3.1)	K(E-3.0)					
C-SP-006	SP	F			Adopt processes to track customer requests, needs, and satisfaction.		K(E-3.0)	K(E-3.0)					
C-SP-007	SP	G			Compare different error detection and correction methods for their data overhead, implementation complexity, and relative execution time for encoding, detecting, and correcting errors and ensure that any error does not affect humans adversely.		K(F-3.1)	K(F-3.1)					
C-SP-008	SP	H	Computer Literacy	コンピューター ラテラシー	Know how to operate UNIX/LINUX-like computer systems to create, print, and view documents, and to communicate with others via e-mail and other network media with care to security and ethics.		K(F-3.2)	K(F-3.2)					
C-SP-009	SP	I	Creativity and ethics	創造性と倫理観	Recognize the professional and ethical responsibilities as an engineer, and can set, solve, and evaluate technical problems in society.		K(G-6.4)	K(G-6.4)					
C-SP-010	SP	J	Ability to self-learn 学習する能力	学習する能力	Respond to changes in social environment and technology, and learn spontaneously throughout life.		K(G-6.2)	K(G-6.2)					
C-SP-011-1	SP	K	Scientific thinking 科学的思考力	科学的思考力	Apply knowledge in the fields of mathematics, natural science, and information technology, as well as scientific thinking skills such as logical thinking and objective judgment acquired through their acquisition, to problem solving.		K(G-5.5)	K(G-5.5)					
C-SP-011-2	SP	K	論理的・科学的思考能力	論理的・科学的思考能力	教学・自然科学・情報技術分野の科目の知識と、それらの習得を通じて身につけた論理的な思考力や客観的判断力などの科学的思考力を、問題解決に応用できる		K(C-5.4)	K(C-5.4)					
C-SP-012	SP	L	Cross-cultural understanding 真文化理解	Cross-cultural understanding 真文化理解	Percept human society from a global perspective and consider the coexistence of nature and human beings, and the happiness, health, and welfare of humankind.		K(C-4.5)	K(C-4.5)					
C-SP-013-1	SP	M	Effective communication 豊かなコミュニケーション能力	豊かなコミュニケーション能力	Express one's own thoughts and judgments effectively both inside and outside the nation and to communicate them to others through written, oral, and information media.		K(C-3.1)	K(C-3.1)					
C-SP-013-2	SP	M	Effective communication 豊かなコミュニケーション能力	豊かなコミュニケーション能力	Express one's own thoughts and judgments effectively both inside and outside the nation and to communicate them to others through written, oral, and information media.		K(C-3.1)	K(C-3.1)					
C-SP-014	SP	N	Team working abilities チームで働く能力	チームで働く能力	Determine the actions that should be taken by oneself and others in collaborative work, and to carry out and work on them.		K(C-2.2)	K(C-2.2)					
C-SP-015	SP	O	対話的思考能力	対話的思考能力	向者との協働において、自己及び他者のなすべき行動を判断し、実行・働きかけることができる		K(C-2.1)	K(C-2.1)					
C-SP-016	SP	P	よりかえり能力	よりかえり能力	対話を通じて自分の考え方を修正・発展させることができる 学んだ知識から自分の考え方を振り返り、意味づけしていくことができる		K(C-1.5)	K(C-1.5)					
MS-Mathematics and Sciences													
C-MS-001	MS	A			Understand the method to solve systems of linear equations		K(C-3.0)	K(C-3.0)					
C-MS-002	MS	B			Understand concepts to treat linear spaces (rank of linear map, determinant of linear transform, base and dimension of linear spaces, etc.)		K(C-3.1)	K(C-3.1)					
C-MS-003	MS	C			Understand eigenvalue, eigenvectors and diagonalization of square matrices		K(C-3.1)	K(C-3.1)					
C-MS-004	MS	D			Understand the theory of groups, rings and fields and apply them for operator theory		K(C-2.0)	K(C-2.0)					
C-MS-005	MS	E			Understand basic logics including first order predicate logic and resolution principles of logical formalization of natural number theory		K(C-2.3)	K(C-2.3)					
C-MS-006	MS	F			Understand topological invariants or characteristics of geometric objects (including homology group of objects)		K(C-2.0)	K(C-2.0)					
C-MS-007	MS	G			Understand derivative and integral of functions of one variable		K(C-2.1)	K(C-2.1)					
C-MS-008	MS	H			Understand expansion of functions: elementary functions,		K(C-2.1)	K(C-2.1)					
C-MS-009	MS	I			Understand derivative and integral of functions of multiple variables		K(C-1.6)	K(C-1.6)					
C-MS-010	MS	J			Understand limit of sequence of functions		K(C-1.5)	K(C-1.5)					
C-MS-011	MS	K			Understand Fourier series, Fourier integral, Laplace transform and discrete Fourier transform		K(C-1.5)	K(C-1.5)					
C-MS-012	MS	L			Understand holomorphic functions, complex integral, Cauchy's integral theorem, Taylor/Laurent series, etc.		K(C-1.5)	K(C-1.5)					
C-MS-013	MS	M			Understand mathematical definitions of error, mean, variance, correlation, estimation, etc.		K(C-1.5)	K(C-1.5)					
C-MS-014	MS	N			Understand law of large number, Gaussian distribution		K(C-1.5)	K(C-1.5)					
C-MS-015	MS	O			Understand equation of motion, momentum, work, energy, angular momentum and the law of gravity, etc.		K(C-1.5)	K(C-1.5)					
C-MS-016	MS	P			Understand electric field, magnetic field, Ampere's law and electromagnetic induction,		K(C-1.5)	K(C-1.5)					
C-MS-017	MS	Q			Understand Maxwell's equations, and electromagnetic wave.		K(C-1.5)	K(C-1.5)					
C-MS-018	MS	R			Understand wave-particle duality of microscopic objects.		K(C-1.5)	K(C-1.5)					
C-MS-019	MS	S			Understand uncertainty principle, Schrodinger equation, tunneling and spin,		K(C-1.5)	K(C-1.5)					
C-MS-020	MS	T			Understand the behavior of semiconductor		K(C-1.5)	K(C-1.5)					
C-MS-021	MS	U			Understand relations among physics, chemical, logic circuits and computer systems.		K(C-1.5)	K(C-1.5)					
C-MS-022	MS	V			Understand the statistical thermodynamics		K(C-1.5)	K(C-1.5)					
C-MS-023	MS	W			Comprehend the relationship between macro- and micro physics		K(C-1.5)	K(C-1.5)					
EC-English Communication													
C-EC-001-1	EC	A	Academic Oral Communication-1		Demonstrate English language competency, at the word and sentence level, in understanding spoken language in the academic genre.		K(E-3.0)	K(E-3.0)					
C-EC-001-2	EC	A	Academic Oral Communication-2		Demonstrate English language competency, at the word and sentence level, in understanding spoken language in the academic genre.		K(E-3.0)	K(E-3.0)					
C-EC-001-3	EC	A	Academic Oral Communication-3		Demonstrate English language competency, at the word and sentence level, in understanding spoken language in the academic genre.		K(E-3.0)	K(E-3.0)					

C.2.2: Computer Science Draft Competencies										Inventing		D-11				
Code	Field	Key	Title (En)	Title (Ja)	Statement (En)	Statement (Ja)	Statement (Ja)	Statement (Ja)	Statement (Ja)	English Language Knowledge Areas	Liberal Arts Knowledge Areas	Fundational and Professional Knowledge	Disposition	English Language Knowledge Areas	Liberal Arts Knowledge Areas	
C-EC-001-4	EC	A	Academic Oral Communication-4		Demonstrate English language competency, at the word and sentence level, in understanding spoken language in the academic genre.				Relationship Management K(E-2)	Relationship Management K(E-2)	Relationship Management K(E-2)		Mathematics and Statistics K(P-12)	Mathematics and Statistics K(P-12)	Metaclasses D-10	O
C-EC-001-5	EC	A	Academic Oral Communication-5		Demonstrate English language competency, at the word and sentence level, in understanding spoken language in the academic genre.				Multi-task Presentation and Management K(E-7)	Multi-task Presentation and Management K(E-7)	Multi-task Presentation and Management K(E-7)		Quality Assurance / Control K(P-11)	Quality Assurance / Control K(P-11)	Responsibility D-9	O
C-EC-001-6	EC	A	Academic Oral Communication-6		Demonstrate English language competency, at the word and sentence level, in understanding spoken language in the academic genre.				Research and Self-Study/Learner K(E-6)	Research and Self-Study/Learner K(E-6)	Research and Self-Study/Learner K(E-6)		Collaboration and Teamwork K(P-5)	Collaboration and Teamwork K(P-5)	Collaborative D-8	O
C-EC-002-1	EC	B	English Language Fluency-1		Apply the English knowledge they have with increased speed and fluency.				Project and Task Organization Planning K(E-4)	Project and Task Organization Planning K(E-4)	Project and Task Organization Planning K(E-4)		Time Management K(P-10)	Time Management K(P-10)	Time Management K(P-10)	O
C-EC-002-2	EC	B	English Language Fluency-2		Apply the English knowledge they have with increased speed and fluency.				Problem Solving and Troubleshooting K(E-2)	Problem Solving and Troubleshooting K(E-2)	Problem Solving and Troubleshooting K(E-2)		Written Communication K(P-1)	Written Communication K(P-1)	Written Communication K(P-1)	O
C-EC-002-3	EC	B	English Language Fluency-3		Apply the English knowledge they have with increased speed and fluency.				Oral Communication and Presentation K(E-3)	Oral Communication and Presentation K(E-3)	Oral Communication and Presentation K(E-3)		Analytical and Critical Thinking K(E-9)	Analytical and Critical Thinking K(E-9)	Analytical and Critical Thinking K(E-9)	O
C-EC-002-4	EC	B	English Language Fluency-4		Apply the English knowledge they have with increased speed and fluency.				Relationship Management K(E-2)	Relationship Management K(E-2)	Relationship Management K(E-2)		Professional Dispositions D-5	Professional Dispositions D-5	Professional Dispositions D-5	O
C-EC-002-5	EC	B	English Language Fluency-5		Apply the English knowledge they have with increased speed and fluency.				Fluency K(E-6)	Fluency K(E-6)	Fluency K(E-6)		Project-Driven D-4	Project-Driven D-4	Project-Driven D-4	O
C-EC-002-6	EC	B	English Language Fluency-6		Apply the English knowledge they have with increased speed and fluency.				Proposed oral precision K(E-5)	Proposed oral precision K(E-5)	Proposed oral precision K(E-5)		Passionate D-3	Passionate D-3	Passionate D-3	O
C-EC-002-7	EC	B	English Language Fluency-7		Apply the English knowledge they have with increased speed and fluency.				Confidence and assessment K(E-4)	Confidence and assessment K(E-4)	Confidence and assessment K(E-4)		Self-Directed D-2	Self-Directed D-2	Self-Directed D-2	O
C-EC-002-8	EC	B	English Language Fluency-8		Apply the English knowledge they have with increased speed and fluency.				Thematic development K(E-3)	Thematic development K(E-3)	Thematic development K(E-3)		Adaptive D-1	Adaptive D-1	Adaptive D-1	O
C-EC-003-1	EC	C	Descriptive Academic English-1		Demonstrate English language competency, at the word and sentence level, in expressing descriptive function types in the academic genre.				Turn-taking K(E-2)	Turn-taking K(E-2)	Turn-taking K(E-2)		Social Justice K(E-3)	Social Justice K(E-3)	Social Justice K(E-3)	O
C-EC-003-2	EC	C	Descriptive Academic English-2		Demonstrate English language competency, at the word and sentence level, in expressing descriptive function types in the academic genre.				Fluency K(E-3)	Fluency K(E-3)	Fluency K(E-3)		Community K(E-3)	Community K(E-3)	Community K(E-3)	O
C-EC-004-1	EC	D	Argumentative Academic English-2		Demonstrate English language competency, at the word and sentence level, in expressing argumentative function types in the academic genre.				Semiotic Argumentation K(E-2)	Semiotic Argumentation K(E-2)	Semiotic Argumentation K(E-2)		Ornithological control K(E-6)	Ornithological control K(E-6)	Ornithological control K(E-6)	O
C-EC-004-2	EC	D	Argumentative Academic English-2		Demonstrate English language competency, at the word and sentence level, in expressing argumentative function types in the academic genre.				Vocabulary strings K(E-12)	Vocabulary strings K(E-12)	Vocabulary strings K(E-12)		Phonological control K(E-15)	Phonological control K(E-15)	Phonological control K(E-15)	O
C-EC-004-3	EC	D	Argumentative Academic English-3		Demonstrate English language competency, at the word and sentence level, in expressing argumentative function types in the academic genre.				Grammatical accuracy K(E-13)	Grammatical accuracy K(E-13)	Grammatical accuracy K(E-13)		Vocabulary control K(E-14)	Vocabulary control K(E-14)	Vocabulary control K(E-14)	O
C-EC-004-4	EC	D	Argumentative Academic English-4		Demonstrate English language competency, at the word and sentence level, in expressing argumentative function types in the academic genre.				Signaling K(C-6)	Signaling K(C-6)	Signaling K(C-6)		Circuit and Electronics K(C-3)	Circuit and Electronics K(C-3)	Circuit and Electronics K(C-3)	O
C-EC-005-1	EC	E	Professional English Writing-1		Apply professional writing strategies (e.g., organization, layout, formatting, text-graphics coordination and content judgment).				Digital Designer K(C-2)	Digital Designer K(C-2)	Digital Designer K(C-2)		Architectural and Organizational K(C-6.1)	Architectural and Organizational K(C-6.1)	Architectural and Organizational K(C-6.1)	O
C-EC-005-2	EC	E	Professional English Writing-2		Apply professional writing strategies (e.g., organization, layout, formatting, text-graphics coordination and content judgment).				Data Structures, Algorithms and Complexity K(C-3.8)	Data Structures, Algorithms and Complexity K(C-3.8)	Data Structures, Algorithms and Complexity K(C-3.8)		Computer Systems Fundamentals K(C-5.6)	Computer Systems Fundamentals K(C-5.6)	Computer Systems Fundamentals K(C-5.6)	O
C-EC-005-3	EC	E	Professional English Writing-3		Apply professional writing strategies (e.g., organization, layout, formatting, text-graphics coordination and content judgment).				Operating Systems K(C-5.1)	Operating Systems K(C-5.1)	Operating Systems K(C-5.1)		Programming Fundamentals K(C-3.5)	Programming Fundamentals K(C-3.5)	Programming Fundamentals K(C-3.5)	O
C-EC-006-1	EC	F	Designing Technical Presentations-1		Design a technical presentation, find synonyms, and present research without notes.				Platform-Based Development K(C-4.5)	Platform-Based Development K(C-4.5)	Platform-Based Development K(C-4.5)		Software Design K(C-4.9)	Software Design K(C-4.9)	Software Design K(C-4.9)	O
C-EC-006-2	EC	F	Designing Technical Presentations-2		Design a technical presentation, find synonyms, and present research without notes.				Systematic Modelling and Analysis K(C-3.3)	Systematic Modelling and Analysis K(C-3.3)	Systematic Modelling and Analysis K(C-3.3)		Software Process K(C-2.2)	Software Process K(C-2.2)	Software Process K(C-2.2)	O
C-EC-007	EC	G	Poster Creative		Create a poster for a research presentation.				Integrated System Technology K(C-3.7)	Integrated System Technology K(C-3.7)	Integrated System Technology K(C-3.7)		Virtual Systems and Services K(C-3.1)	Virtual Systems and Services K(C-3.1)	Virtual Systems and Services K(C-3.1)	O
C-EC-008-1	EC	H	Research Paper Writing-1		Write a research paper which is clear, concise, correct, objective and formal.				User Experience Design K(C-3.8)	User Experience Design K(C-3.8)	User Experience Design K(C-3.8)		Data and Information Management K(C-2.0)	Data and Information Management K(C-2.0)	Data and Information Management K(C-2.0)	O
C-EC-008-2	EC	H	Research Paper Writing-2		Write a research paper which is clear, concise, correct, objective and formal.				Embedded Systems K(C-3.6)	Embedded Systems K(C-3.6)	Embedded Systems K(C-3.6)		Requirements Analysis and Specification K(C-2.3)	Requirements Analysis and Specification K(C-2.3)	Requirements Analysis and Specification K(C-2.3)	O
C-EC-009-1	EC	I	Research Paper Presentation-1		Deliver a research presentation to showcase the research project.				System Analysis and Design K(C-2.2)	System Analysis and Design K(C-2.2)	System Analysis and Design K(C-2.2)		Project Management K(C-1.4)	Project Management K(C-1.4)	Project Management K(C-1.4)	O
C-EC-009-2	EC	I	Research Paper Presentation-2		Deliver a research presentation to showcase the research project.				Security Issues and Principles K(C-2.1)	Security Issues and Principles K(C-2.1)	Security Issues and Principles K(C-2.1)		Enterprise Architecture K(C-1.4)	Enterprise Architecture K(C-1.4)	Enterprise Architecture K(C-1.4)	O
C-EC-009-3	EC	I	Research Paper Presentation-3		Deliver a research presentation to showcase the research project.				Platform and Distributed Computing K(C-4.0)	Platform and Distributed Computing K(C-4.0)	Platform and Distributed Computing K(C-4.0)		IS Management and Leadership K(C-1.3)	IS Management and Leadership K(C-1.3)	IS Management and Leadership K(C-1.3)	O
C-EC-009-4	EC	I	Research Paper Presentation-4		Deliver a research presentation to showcase the research project.				Internet of Things K(C-3.2)	Internet of Things K(C-3.2)	Internet of Things K(C-3.2)		Security Policy and Management K(C-1.2)	Security Policy and Management K(C-1.2)	Security Policy and Management K(C-1.2)	O
C-EC-009-5	EC	I	Research Paper Presentation-5		Deliver a research presentation to showcase the research project.				Intelligent Systems AI K(C-2.2)	Intelligent Systems AI K(C-2.2)	Intelligent Systems AI K(C-2.2)		Software Quality Verification and Validation K(C-4.1)	Software Quality Verification and Validation K(C-4.1)	Software Quality Verification and Validation K(C-4.1)	O
C-EC-009-6	EC	I	Research Paper Presentation-6		Deliver a research presentation to showcase the research project.				Project Management K(C-2.0)	Project Management K(C-2.0)	Project Management K(C-2.0)		Database K(C-1.1)	Database K(C-1.1)	Database K(C-1.1)	O
C-EC-009-7	EC	I	Research Paper Presentation-7		Deliver a research presentation to showcase the research project.				System Analysis and Design K(C-2.2)	System Analysis and Design K(C-2.2)	System Analysis and Design K(C-2.2)		Research Paper Writing-1 K(C-1.1)	Research Paper Writing-1 K(C-1.1)	Research Paper Writing-1 K(C-1.1)	O
C-EC-009-8	EC	I	Research Paper Presentation-8		Deliver a research presentation to showcase the research project.				Virtual Reality K(C-3.1)	Virtual Reality K(C-3.1)	Virtual Reality K(C-3.1)		Research Paper Writing-2 K(C-1.1)	Research Paper Writing-2 K(C-1.1)	Research Paper Writing-2 K(C-1.1)	O
C-EC-009-9	EC	I	Research Paper Presentation-9		Deliver a research presentation to showcase the research project.				User Experience Design K(C-3.8)	User Experience Design K(C-3.8)	User Experience Design K(C-3.8)		Research Paper Presentation-1 K(C-2.3)	Research Paper Presentation-1 K(C-2.3)	Research Paper Presentation-1 K(C-2.3)	O
C-EC-010-1	EC	J	English Communication Strategies-1		Understand and use English effectively and independently via a variety of strategies				Virtual Systems and Services K(C-3.1)	Virtual Systems and Services K(C-3.1)	Virtual Systems and Services K(C-3.1)		Research Paper Presentation-2 K(C-2.0)	Research Paper Presentation-2 K(C-2.0)	Research Paper Presentation-2 K(C-2.0)	O
C-EC-010-2	EC	J	English Communication Strategies-2		Understand and use English effectively and independently via a variety of strategies				User Experience Design K(C-3.8)	User Experience Design K(C-3.8)	User Experience Design K(C-3.8)		Research Paper Presentation-3 K(C-2.3)	Research Paper Presentation-3 K(C-2.3)	Research Paper Presentation-3 K(C-2.3)	O
C-EC-010-3	EC	J	English Communication Strategies-3		Understand and use English effectively and independently via a variety of strategies				Embedded Systems K(C-3.6)	Embedded Systems K(C-3.6)	Embedded Systems K(C-3.6)		Project Management K(C-1.4)	Project Management K(C-1.4)	Project Management K(C-1.4)	O
C-EC-010-4	EC	J	English Communication Strategies-4		Understand and use English effectively and independently via a variety of strategies				System Analysis and Design K(C-2.2)	System Analysis and Design K(C-2.2)	System Analysis and Design K(C-2.2)		Enterprise Architecture K(C-1.4)	Enterprise Architecture K(C-1.4)	Enterprise Architecture K(C-1.4)	O
C-EC-010-5	EC	J	English Communication Strategies-5		Understand and use English effectively and independently via a variety of strategies				Platform and Distributed Computing K(C-4.0)	Platform and Distributed Computing K(C-4.0)	Platform and Distributed Computing K(C-4.0)		IS Management and Leadership K(C-1.3)	IS Management and Leadership K(C-1.3)	IS Management and Leadership K(C-1.3)	O
C-EC-010-6	EC	J	English Communication Strategies-6		Understand and use English effectively and independently via a variety of strategies				Internet of Things K(C-3.2)	Internet of Things K(C-3.2)	Internet of Things K(C-3.2)		Security Policy and Management K(C-1.2)	Security Policy and Management K(C-1.2)	Security Policy and Management K(C-1.2)	O
C-EC-010-7	EC	J	English Communication Strategies-7		Understand and use English effectively and independently via a variety of strategies				Intelligent Systems AI K(C-2.2)	Intelligent Systems AI K(C-2.2)	Intelligent Systems AI K(C-2.2)		Software Quality Verification and Validation K(C-4.1)	Software Quality Verification and Validation K(C-4.1)	Software Quality Verification and Validation K(C-4.1)	O
C-EC-011-1	EC	K	High Frequency English Expressions-1													

C.2.2: Computer Science Draft Competencies										Disposition	
Code	Field	Key	Title (En)	Title (Ja)	Statement (En)	Statement (Ja)	English Language Knowledge Areas			Fundational and Professional Knowledge	
							Ethical and Intercultural Perspectives			Projective	
C-HS-012	HS	L	地城社会学的な視点	地域の肥状に基づいた独自の見解を持つる。	地域の肥状に基づいた独自の見解を持つる。	地域の肥状に基づいた独自の見解を持つる。	人間性・倫理性を有する居としての各自の自覚	K(L-3,3)	B-II	Metacognitivety and Self-awareness	D-10
C-HS-013	HS	M	of the basics of public health and	公衆衛生の基本としきみの理解	Comprehension of the essential public health basics and mechanisms	公衆衛生の基本的ななくみと課題について、それを理解することができます	人の発達課題の個性と気質	K(L-2,3)	B-II	Quality Assurance - Control	D-9
C-HS-014	HS	N	the basics of business administration	経営の諸活動全般に関する理解1	経営に従事する取引関係の主体について理解・説明することができます	社会の多様性の理解と異文化化の理解	K(L-3,3)	B-II	Time Management	K(P-10)	
C-HS-015	HS	O	the basics of business administration	経営の諸活動全般に関する理解2	それぞれの主体の活動に開連する経営学の諸領域について理解・説明することができます	科学的な思考見解・観察力	K(L-1,3)	B-II	Analytical and Critical Thinking	K(P-9)	
C-HS-016	HS	P	the basics of business administration	経営の諸活動全般に関する理解3	それぞれの主体に期待される活動や能力について、自らの考観を加えて解決策を提案することができます	批判・創造的思考力	K(L-1,1)	B-II	Relationship Management	K(P-8)	
C-HS-017	HS	O	the basics of business administration	ジメントに関する理解1	組織内の人々のマネジメントに関わる諸現象を特定し、説明することができます	柔軟性・機動を持持する能力	K(L-3,1)	B-II	Multi-Task Prioritization and Management	K(P-7)	
C-HS-018	HS	R	the basics of business administration	ジメントに関する理解2	組織内の人々のマネジメントの諸現象に開連する基礎的な理論を理解・説明することができます	生命や人権・ODLの理解	K(L-2,3)	B-II	Problem Solving and Troubleshooting	K(P-3)	
C-HS-019	HS	S	the basics of business administration	ジメントに関する理解3	マネジメントに対する諸問題について、基礎的な理論に基づき、考観を加えて解決策を提案することができます	人の発達課題の個性と気質	K(L-2,2)	B-II	Research and Skill Transfer/Training	K(P-6)	
C-HS-020	HS	T	the basics of business administration	メントに関する理解1	組織と環境の調整についての諸現象を特定し、説明することができます	社会的・組織的の視野と異文化化の理解	K(L-3,1)	B-II	Oral Communication and Presentation	K(P-1)	
C-HS-021	HS	U	the basics of business administration	メントに関する理解2	組織と環境の調整についての諸現象に開連する基礎的な理論を理解・説明することができます	科学的な思考見解・観察力	K(L-1,3)	B-II	Propositional prediction	K(E-3,5)	
C-HS-022	HS	V	the basics of business administration	メントに関する理解3	組織と環境の調整についての諸現象について、基礎的な理論に基づいて考観し、考観を加えて解決策を提案することができます	命題式論理の理解	K(L-1,4)	B-II	Cohesiveness and cohesiveness	K(E-3,4)	
C-HS-023	HS	W	the basics of business administration	動に関わる全般的な理解1	人のこころや行動についての諸現象を特定し、説明することができます	命題式論理の理解	K(L-1,4)	B-II	Thematic development	K(E-3,3)	
C-HS-024	HS	X	the basics of business administration	動に関わる全般的な理解2	人のこころや行動についての基礎的な理論を理解・説明することができます	命題式論理の理解	K(L-1,4)	B-II	Turn-taking	K(E-3,2)	
C-HS-025	HS	Y	the basics of business administration	動に関わる全般的な理解3	人のこころや行動についての諸現象を特定し、説明することができます	命題式論理の理解	K(L-1,4)	B-II	Signal Processing	K(C-5,4)	
SS-Sports Science										Flexibility	
C-SS-001	SS	A	management and operation	運動環境の管理運用	Understand how to use sports facilities and sports implements, and to manage and operate them appropriately to suit the situation.	柔軟性・機動を持持する能力	K(E-3,1)	B-II	Propositional prediction	K(E-3,5)	
C-SS-002	SS	B	Caring for mental and physical	心身の状態への配慮	To recognize and take care of own physical and mental condition	命題式論理の理解	K(E-2,1)	B-II	Cohesiveness and cohesiveness	K(E-3,4)	
C-SS-003	SS	C	Physiological Adaptation to the environment	環境への適応限界	Comprehend the adaptive limits of living organisms to the environment and cope with them appropriately.	命題式論理の理解	K(E-1,5)	B-II	Orthographic control	K(E-1,5)	
C-SS-004	SS	D	benefits of exercise	運動効果の理解	Understand the immediate and long-term benefit of exercise.	命題式論理の理解	K(E-1,5)	B-II	Phonological control	K(E-1,5)	
C-SS-005	SS	E	life-skills	ライフスキル	Demonstrate skills such as motivation, perseverance, self-control, diligence, cooperation, tolerance, and other so-called non-cognitive abilities to behave and not to behave proactively and appropriately depending on the situation.	命題式論理の理解	K(E-1,5)	B-II	Vocabulary control	K(E-1,4)	
C-SS-006	SS	F	Time/stimulus management	時間・刺激のマニメント	Management of time and stimulus with consideration for the balance of exercise, nutrition, and rest.	命題式論理の理解	K(E-1,5)	B-II	Grammatical accuracy	K(E-1,3)	
C-SS-007	SS	G	Training	基礎訓練	Understands basic training theories	命題式論理の理解	K(E-1,5)	B-II	Coherence and cohesion	K(E-1,3)	
C-SS-008	SS	H	Measurement, evaluation and modification of physical fitness	体力及みの測定・評価	To critically reflect on personal fitness levels and activities through measurement and evaluation, and to modify and develop personal behaviors.	命題式論理の理解	K(E-1,5)	B-II	Intelligent Systems AI	K(C-3,2)	
C-SS-009	SS	I	Values of sports and recreation	スポーツ及びレクリエーション	Comprehend the unique values and benefits of sports and recreation and express a sense of them.	命題式論理の理解	K(E-1,5)	B-II	Virtual Systems and Services	K(C-3,1)	
TE-Teaching Education										Computer Networks	
C-TE-001	TE	A	teacher-training	教職課程	Acquired basic knowledge and skills for teacher licensure	教員免許状を取得するための基本的な知識と技能を身につけてい	27	B-II	Parallel and Distributed Computing	K(C-2,3)	

関連資料 References

1. [認知能力レベル\(B-I～B-VI\)の定義](#)
[Definitions of Levels of Cognitive Skills\(B-I～B-VI\)](#)
2. [スキルマップ\(各科目とコンピテンシーの対応表\)](#)
[Skill Map\(Correspondence chart between courses and competencies\)](#)
3. [Knowledge, Disposition 一覧](#)
[List of Knowledge, Disposition](#)