Osaka Metropolitan University

Graduate School of Informatics

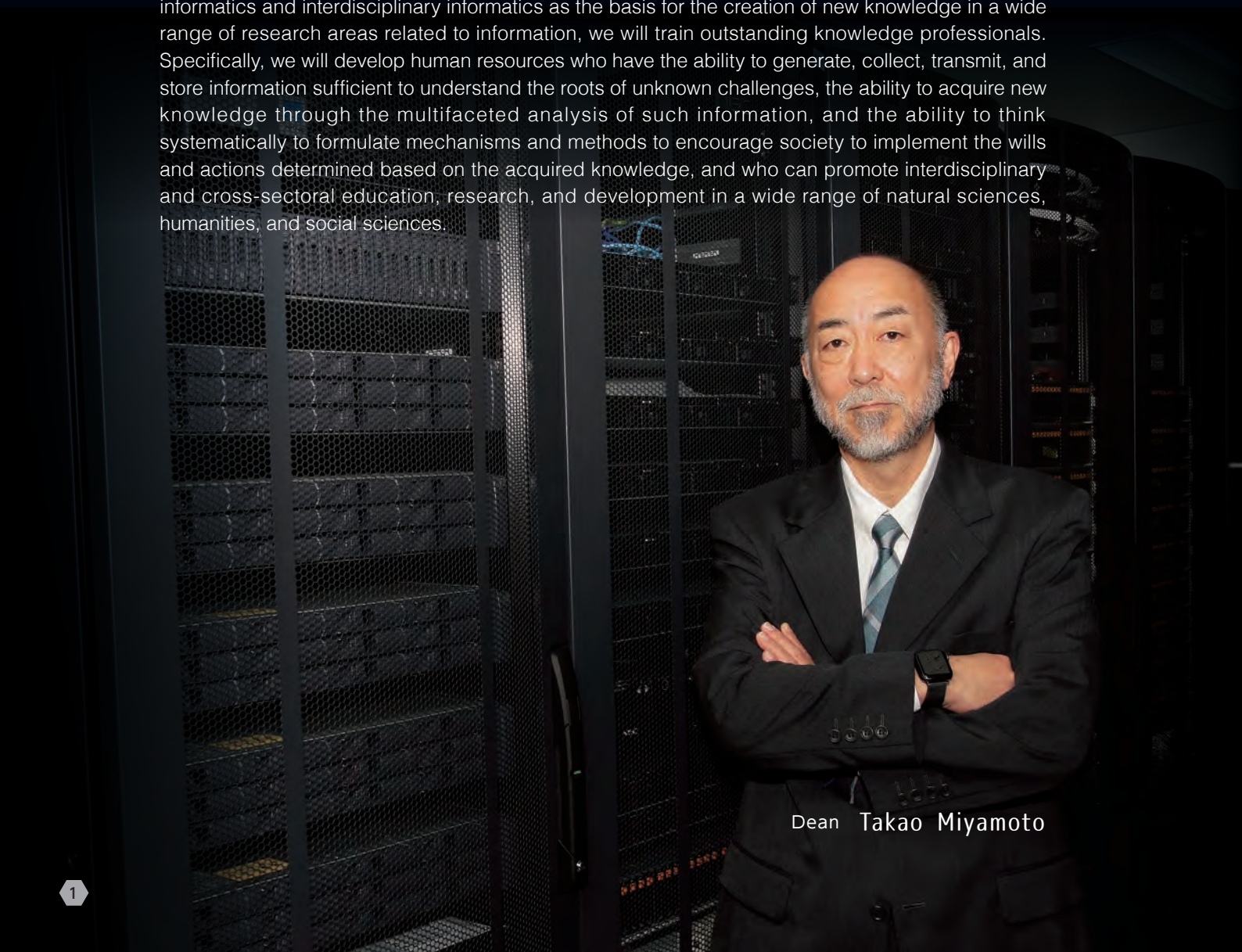
Osaka Metropolitan University

Using Knowledge in Informatics to Create a Sustainable Society

In order to create a society (sustainable society) in which the global environment and natural environment are properly preserved, and development is being carried out to meet the needs of the current generation without compromising the needs of future generations, what is necessary is the further advancement of elemental technologies for information and communication, as proposed in Society 5.0, as well as “systematization capability” to combine elemental technologies for the solution of problems as a whole in an optimal way. Moreover, it is also necessary to understand social issues that are newly created through problem solving. Accordingly, it is essential to possess the ability to think systematically in order to understand the interactions between elemental technologies, while analyzing the psychological state of humans who respond to the development and innovation of information and communication technology as well as advanced human computer interface technology, predict changes in society as a whole, and gain new insights that go beyond mere technology and knowledge.

Informatics is a field of study that systematizes information as an academic discipline, independently interpreting information created from all disciplines, to create a new interdisciplinary field of research through not only the development of informatics itself but also the fusion of all disciplines with information as the core.

The Graduate School of Informatics consists of the Department of Core Informatics centered on information science, which pursues truth and principles related to information, and information engineering, which aims to establish technology that handles information; and the Department of Interdisciplinary Informatics centered on the application and development of information in the natural sciences as well as in the humanities and social sciences. With informatics consisting of core informatics and interdisciplinary informatics as the basis for the creation of new knowledge in a wide range of research areas related to information, we will train outstanding knowledge professionals. Specifically, we will develop human resources who have the ability to generate, collect, transmit, and store information sufficient to understand the roots of unknown challenges, the ability to acquire new knowledge through the multifaceted analysis of such information, and the ability to think systematically to formulate mechanisms and methods to encourage society to implement the wills and actions determined based on the acquired knowledge, and who can promote interdisciplinary and cross-sectoral education, research, and development in a wide range of natural sciences, humanities, and social sciences.



Dean Takao Miyamoto

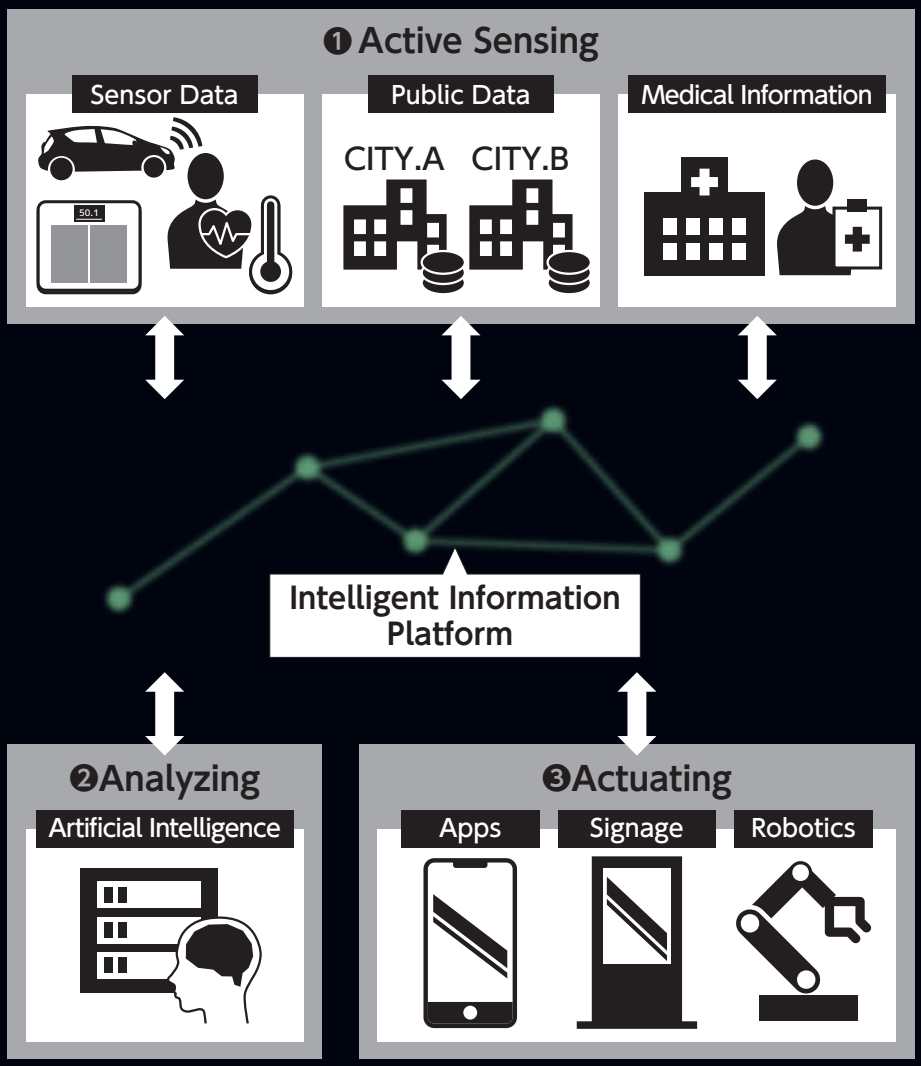
AAA abilities in informatics

The term “AAA” is an abbreviation for Active Sensing, Analyzing, and Actuating. These refer to the following abilities:

Active Sensing : The ability to generate, collect, transmit, and store information sufficient to understand the roots of unknown challenge

Analyzing : The ability to acquire knowledge through the multifaceted analysis of such information

Actuating : The ability to formulate mechanisms and methods to encourage society to implement the wills and actions determined based on the acquired knowledge



Program Features

A notable characteristic of the Graduate School is its division of the field of Informatics into Core Informatics and Interdisciplinary Informatics. Core informatics broadly classifies the central elements of Informatics into the “head” (Intelligent Informatics) and the “body” upon which it rests (System Informatics), and its basis is formed by fusing together fields in science and engineering that address these elements. Interdisciplinary Informatics, on the other hand, is more comprehensive and seeks to solve real-world problems by linking the core elements of the field with the outside world, with the help of the natural sciences, humanities, social sciences, and other disciplines. The Graduate School conducts broad educational and research activities, with informatics consisting of Core Informatics and Interdisciplinary Informatics as the basis for the creation of new knowledge.

Department of Core Informatics

Admission Capacity	Master’s Program	Doctoral Program
	65 students	10 students

Department of Interdisciplinary Informatics

Admission Capacity	Master’s Program	Doctoral Program
	25 students	5 students

※All admission capacities are tentative.

Curriculum Map

Department of Core Informatics

Master's Degree Program

Graduate school common courses | Division Special Seminars | Division Research Guidance Subjects | Division Fundamental Subjects | Division Special Subjects

Curricula

	1st year		2nd year	
	First Semester	Second Semester	First Semester	Second Semester
Compulsory Subjects	Cultivation of high ethical standards Research Integrity A			
	Cultivation of practical skills Practicum in Machine Learning Programming	Practicum in Building Advanced Software Environments	Cultivation of Problem-solving and Research Skills Special Project in Core Informatics 1	Special Project in Core Informatics 2
Elective Subjects	[Basic Informatics] Design and Analysis of Algorithms — Probability Theory and Statistics	Cultivation of Systems Thinking and Cross-disciplinary Adaptability Seminar in Core Informatics		
	Cultivation of Global Communication Skills Technical Writing and Presentation			
Intelligent Systems Subjects	[Data Science] Big Data Analysis — Data Mining	[Data Science] Human-Computer Interaction		
		[Mathematical Modeling and Simulation] Social Informatics		
	[Artificial Intelligence] Introduction to Machine Learning	Deep Learning — Advanced Computational Intelligence		
	[Media Informatics] Linguistic Informatics	Advanced Image Processing		
System Informatics Subjects	[Network Systems] Information Platform Architecture	Advanced and Emerging Communications Technologies — Wireles Network Systems		
	Network System Design	Information Sensing Systems		
	[High Performance Computing] High Performance Computing	[Security] Cyber Security		
	[Signal Processing] Time Series Analysis and Signal Processing	Multi-Agent Systems		

Cultivation of professionals

In the field of Intelligent Informatics, students acquire the knowledge and skills to computerize the human intellectual abilities of recognition, understanding, reasoning, and learning, which are fundamental and unchanging truths, through solving problems in the academic disciplines of signal processing, intelligent systems, media processing, machine learning, and data science, in order to acquire the ability to follow or lead changes even in the event of paradigm shifts in society and technology. Similarly, in the field of System Informatics, students acquire the ability to understand and model subject matter as a system through solving problems in the academic disciplines of parallel processing, measurement control, information networks, security, and signal processing, and acquire the knowledge and skills required to seek optimal solutions for such systems as a whole.

Doctoral Program

Graduate school common courses | Division Research Guidance Subjects | Special Seminars

	1st year		2nd year		3rd year	
	First Semester	Second Semester	First Semester	Second Semester	First Semester	Second Semester
Compulsory Subjects	Cultivation of high ethicalstandards Research Integrity B					
	Cultivation of Problem-solving and Research Skills Special Project in Core Informatics 3	Special Project in Core Informatics 4	Special Project in Core Informatics 5	Special Project in Core Informatics 6	Special Project in Core Informatics 7	Special Project in Core Informatics 8
Elective Subjects	Advanced Seminar in Core Informatics I-1	Advanced Seminar in Core Informatics I-2	Department of Intelligent Systems			
	Advanced Seminar in Core Informatics S-1	Advanced Seminar in Core Informatics S-2	Department of System Informatics			

Cultivation of professionals

The Doctoral Program aims to cultivate researchers and research professionals able to further elevate the level of knowledge, skills, and education in Intelligent Informatics and System Informatics that they acquired in the Master's Program and to apply these in other fields, and who acquire the ability to establish, resolve, and implement their research themes, the ability to communicate their presence, and the ability to manage research and other projects, and are able to leverage and apply these abilities on the international stage, while maintaining high ethical standards and a strong sense of responsibility as a researcher and a professional.

Department of Interdisciplinary Informatics

Master's Degree Program

Graduate school common courses | Division Special Seminars | Division Research Guidance Subjects | Division Fundamental Subjects | Division Special Subjects

Curricula

	1st year		2nd year	
	First Semester	Second Semester	First Semester	Second Semester
Compulsory Subjects	Research Integrity A			
	Basic Topics in Interdisciplinary Informatics			
	Special Seminar in Interdisciplinary Informatics 1	Special Seminar in Interdisciplinary Informatics 2	Special Research on Interdisciplinary Informatics 1	Special Research on Interdisciplinary Informatics 2
Elective Subjects (Informatics Subjects)	Special Topics in Information and Communication Systems	Special Topics in Information Security		
	Special Topics in Information Network	Special Topics in Knowledge Science		
	Special Topics in Data Science	Special Topics in Information Infrastructure		
	Special Topics in Natural Language Processing	Special Topics in Distributed Systems		
	Special Topics in Machine Learning	Special Topics in Information Retrieval Systems		
	Special Topics in Image Information Processing			
Elective Subjects (Interdisciplinary Informatics Subjects)	Special Topics in Marketing	Special Topics in Healthcare Informatics		
	Special Topics in Data Mining	Special Topics in Manufacturing Science		
	Special Topics in Information Economy	Special Topics in Production System Science		
	Special Topics in Production Management Systems	Special Topics in Spatial Information Systems		
	Special Topics in Materials Informatics			
	Special Topics in Cognitive Psychology			

Cultivation of professionals

- Human resources who have acquired knowledge and skills in specialized disciplines related to informatics, the foundation upon which an advanced information society is built
- Human resources who have acquired the ability to design systems aimed at creating new value by integrating Knowledge Science and Information Systems Engineering with Social Science and other fields, as well as the scientific analytical and thinking skills required to address advances in technology and changes in society
- Human resources with a deep understanding of information and communications technologies not only from a technological standpoint but also in terms of their impact on society in the realization of information systems essential to the daily activities of people and society, and who possess high ethical standards, a sense of mission, and a sense of responsibility as a professional

Doctoral Program

Graduate school common courses | Division Research Guidance Subjects | Special Seminars

Curricula

	1st year		2nd year		3rd year	
	First Semester	Second Semester	First Semester	Second Semester	First Semester	Second Semester
Compulsory Subjects	Research Integrity B					
	Special Research on Interdisciplinary Informatics 3	Special Research on Interdisciplinary Informatics 4	Special Research on Interdisciplinary Informatics 5	Special Research on Interdisciplinary Informatics 6	Special Research on Interdisciplinary Informatics 7	Special Research on Interdisciplinary Informatics 8
	Special Seminar in Interdisciplinary Informatics 3	Special Seminar in Interdisciplinary Informatics 4				

Cultivation of professionals

- Human resources capable of advancing and promoting research and development within their own specialized field of informatics
- Human resources capable of promoting academic exchange with neighboring fields and across disciplines
- Human resources capable of contributing to the realization of a sustainable society through the promotion of research and development based on ideas unfettered by conventional frameworks
- Human resources capable of collaborating with researchers in other fields, and who possess a high level of insight gained through academic research that takes a comprehensive view of contemporary society
- Human resources capable of developing and managing new information systems and information services aimed at solving the problems of contemporary society, as well as independently formulating specialized knowledge and theories