



KYOTO UNIVERSITY

# **Designing the future of society**

Kyoto University Collaborative Graduate Program in Design

Program Overview

Collaborative Graduate Program in Design

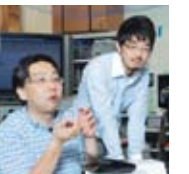


# Working together with societies and integrating the wisdom of various fields

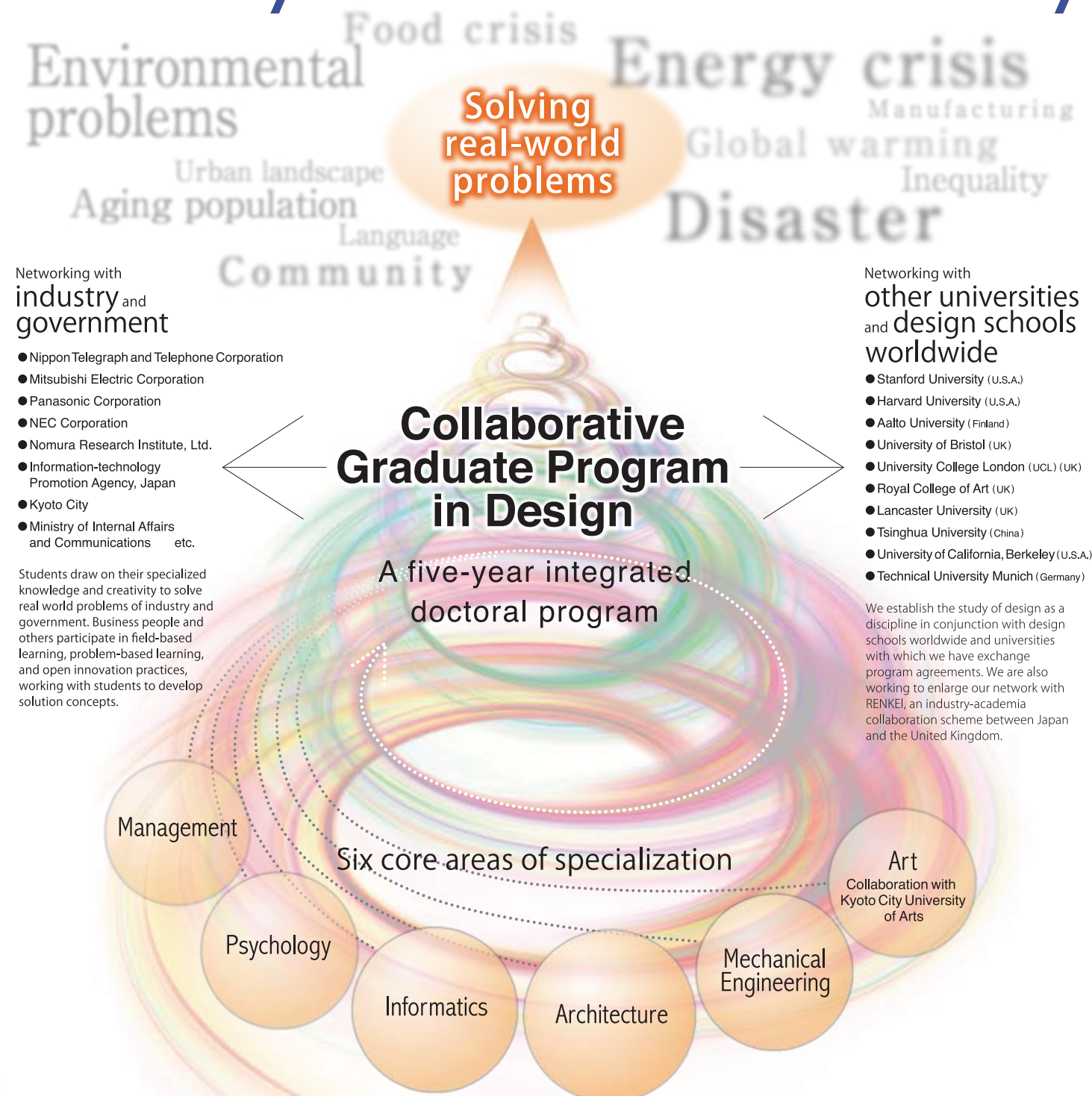
Kyoto University's Collaborative Graduate Program in Design is Japan's first program featuring an integrated, five-year curriculum. In addition to deepening their own level of specialization, students grapple with a variety of actual social problems and attempt to create new social mechanisms while working with specialists in other fields as well as residents of local communities. The Kyoto University Design School encompasses a range of activities that are open to the community, with this program playing a central role.



Community  
collaboration  
and  
cooperation



# Kyoto University Design School

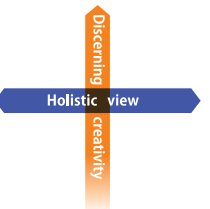


## ■ What does “design” mean at Kyoto University?

Interconnected problems in contemporary society cannot be solved by specialists from single areas. In the context of such complexity, design is a new academic discipline that pursues integrated solutions for complex social problems from the standpoint of total optimization. In doing so, it combines disciplines that have been cultivated at the University over many years and emphasizes collaboration with industry, international organizations, and universities.

## ■ Striving to cultivate “+ Shaped People” who possess a holistic view and creativity

Conventional programs produce either “I Shaped People” (specialists who generate research findings in a single area of specialization) or “T Shaped People” (generalists who excel in their ability to negotiate and cooperate). This program, in sharp distinction, strives to cultivate “+ Shaped People” — people who create innovation by cooperating beyond their own areas of specialization. These are precisely the type of people society needs to serve as next-generation leaders.



Designing social systems  
and architecture



## The Design Innovation Center, where students study on the front lines of society

The program is offered at the Design Innovation Center in Kyoto Research Park\* in conjunction with the University's Yoshida and Katsura campuses.

\*Kyoto Research Park (KRP), Japan's first private-sector facility dedicated to creating new industries and facilitating industry-academia collaboration, is home to some 250 corporations with businesses in IT and other areas.

The No. 9 Building in KRP, home to the Design Innovation Center





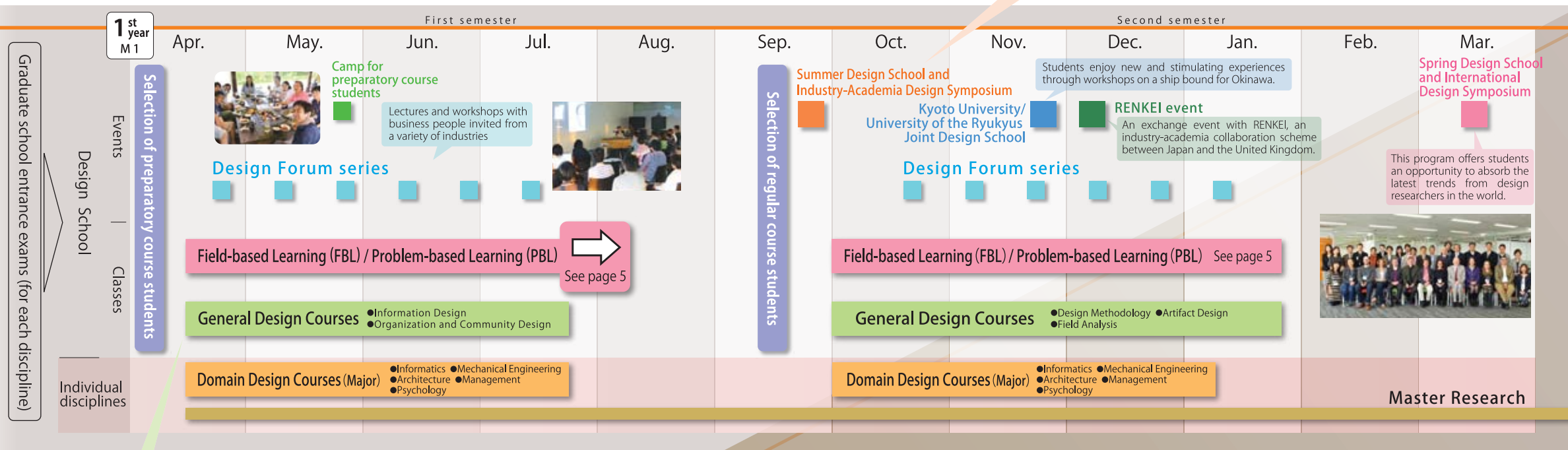
# A five-year program of social immersion to learn across specialist boundaries

First- and second-year students study design approaches and methodologies and work to master a holistic view while participating in seminars (FBL/ PBL) and cultivating creative real-world problem-solving abilities. From their third to fifth year, they participate in problem-solving projects in collaboration with industry, government, and academia while acting as the manager of a team of specialists as well as a specialist researcher. Employing a “collaborative lecture” method where professors from different faculties lecture in the same class and a multiple-advisor system that allows students to enjoy the support of multiple professors, the program strives to cultivate a flexible outlook by incorporating a rich variety of practical learning opportunities.



■ Summer Design School and Industry-Academia Design Symposium

More than 100 people including students and working adults participate in this major summer event every year since 2011. This intensive, three-day workshop explores a variety of contemporary themes. It also includes the Industry-Academia Design Symposium, to which business people from industries are invited to have an exchange of views.



\* Timeline created based on the 2013 academic year schedule. Contents subject to change

**Lead** ■ Applying creativity and a holistic perspective to grapple with more sophisticated issues

In this course, students grapple with complex issues that are larger in scope than the courses in previous years of study. The course involves cooperation among industry, government and academia, and consists of a project that caps each student's time in the program. With the support of multiple advisors, participants summarize the results of activities as specialists in the form of doctoral research. They also lead a team of specialists in the project by developing an overall vision of the problem, drawing out the views of other participants, and guiding the team to a high-order solution.

### Example projects:

- Design of urban areas for a sustainable society
- Support for agriculture in Vietnam using multilingual knowledge communication
- Affluent society supported by cities and mobility

**Before reaching the regular course**

During the first semester of their first year, which serves to prepare them for the program, students are known as preparatory course students. They become regular course students after a selection process before the second semester, at which point their full participation in the five-year program begins.

## The Design School and various areas of specialization

To participate in the program, students are admitted into the graduate school responsible for one of the University's five collaborative areas and subject to the preparatory course selection process. They then study under the program while maintaining an affiliation with their chosen area of specialization.

### ■ Deepening the basic study of design

The General Design Courses are: 1) Abstract Design Theory, which allows students to discuss what design is; 2) General Design Theory, which explores the basis of cross-disciplinary design, including design of artifacts, markets, organizations, and information; and 3) General Design Method, which covers methods that support cross-disciplinary design, such as ethnography, data analysis, modeling, and simulation. All courses are newly offered in this program, and employing a “collaborative lecture” method provides students with a wide variety of interpretations rooted in diverse perspectives.

- **Information Design: Studying methods and techniques for organization and communication of information**

In the Information Design course, students study methods and technologies for communicating knowledge and information effectively while examining a broad range of subject matter, including language, computer interfaces, movies, and photographs. Guest instructors from IT, advertising, and other fields help deepen students' understanding of how information design is actually practiced in the field.

## General Design Courses

2<sup>nd</sup> year  
M 2

Building on their experience  
as first-year (M1)  
students by participating  
in events and FBL/PBL

Master Research

## Qualifying Examination

**3<sup>rd</sup> year**  
D 1

Students become facilitators who coordinate the views of residents, government officials, and specialists on actual problems proposed by corporations and government agencies.

## Open Innovation Practice

ternship

## Field Internship

Student teams conduct fieldwork in Japan and overseas to propose solutions.

## Research Internship

Students utilize the University's international collaborations to undertake overseas internships.

**Domain Design Courses (Minor)** ●Informatics ●Mechanical Engineering ●Architecture  
●Management ●Psychology

### Leading Project (Ph.D. Research)

**5<sup>th</sup> year**  
D 3

## Thesis Defense

**Graduates contribute actively to a variety of fields as “+ Shaped People.”**

■ Degree conferment

Students will receive a Ph.D. degree upon finishing the program, and completion of the Collaborative Graduate Program in Design will be recorded on their diplomas. Please refer to our "Course Guideline" for details.





# An initial step to become a design professional

Seven projects from the first semester of the 2013 academic year

The program's approach to learning is distinguished by a practical and cooperative focus. In the Field-based Learning/Problem-based Learning (FBL/PBL) course that marks the beginning of the master's program, students from different areas of specialization form teams to conduct a multifaceted exploration of how to bring various perspectives to solve problems and issues that arise in the real world, such as communities, medicine, and industrial society.

## Organizational design in crowdsourcing

Coordinator

**Toru Ishida** Professor,  
Dept of Social Informatics,  
Grad School of Informatics



Crowdsourcing is attracting attention as a new labor market in networked societies, requiring network designs capable of generating high-quality results through cooperation among workers who have never met one another directly. In practical work, students conduct a series of experiments using the Amazon Mechanical Turk platform, which is popular in the U.S. and other countries.

## Strategic decision-making through a participatory systems approach

Coordinator

**Tetsuo Sawaragi** Professor,  
Dept of Mechanical Engineering and Science,  
Grad School of Engineering



Students participate in a practical study of solutions for complex problems through systematic thought. They engage in strategic decision-making that can be explained rationally by using structural modeling and decision-making analysis to support the process of identifying problems where mistaken decisions can result in major damage (such as long-term business strategy and organizational responses to large-scale disasters) and evaluating scenarios that describe options. Participants form groups and work to solve problems through their sessions.

## Designing toys that trigger changes in human relationships

Coordinator

**Atsushi Matsubara** Professor,  
Dept of Micro Engineering,  
Grad School of Engineering  
**Naohide Tomita** Professor,  
Dept of Mechanical Engineering and Science,  
Grad School of Engineering



In addition to devising and producing prototypes of toys, students analyze how toys cause changes in human relationships in daily life and consider how the knowledge they gain could be used. They discuss interpersonal relationships from the standpoint of toys through practical sessions in a hospital playroom. These sessions are held with the assistance of the Faculty of Fine Arts and the Graduate School of Arts at Kyoto City University of Arts.

## Design of urban landscapes based on community governance

Coordinator

**Teruyuki Monnai** Professor,  
Dept of Architecture and  
Architectural Engineering,  
Grad School of Engineering



Students explore an approach to urban planning that utilizes local resources through the cooperation of different stakeholders, including communities and public and private entities, focusing on the Kyoto cityscape and asking how to design appealing cityscapes in the context of the contemporary city. Practical work introduces a variety of methodologies including landscape simulations using 3D computer graphics and workshops in the field to enable students to practice landscape design through dialog.

## Design for hospital practice

Coordinator

**Yutaka Yamauchi**  
Senior Lecturer,  
Grad School of Management



This practical program is offered jointly with the Faculty of Fine Arts and the Graduate School of Arts at Kyoto City University of Arts. After conducting field research at medical institutions to develop an awareness of a variety of issues faced in the practice of medicine, students work to design realistic, appealing solutions (productions, mechanisms, etc.). Through the program, they also gain the ability to practice substantive collaboration with specialists in different areas.

## Robots and social design

Coordinator

**Fumitoshi Matsuno** Professor,  
Dept of Mechanical Engineering and Science,  
Grad School of Engineering

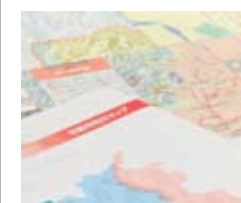


Students propose and commercialize designs for service robots that offer services in a living environment and the society in which they operate. Once they have developed an understanding of basic technologies through the production of a bipedal robot, participants cultivate a comprehensive perspective that includes society and business along with design and integration skills based on knowledge such as universal design, design ethnography and think about new designs for robots and society.

## Disaster prevention and social design

Coordinator

**Haruo Hayashi** Professor,  
Disaster Prevention Research Institute



Students work to create hazard maps with the cooperation of the University's Disaster Prevention Research Institute and a number of NPOs. After assessing risk by simulating flooding and earthquakes, participants apply graphic design and design evaluation to create hazard maps that will be easily understood by residents. By actually creating maps, they discuss easy-to-understand disaster prevention designs with specialists.

### Close-up

## Design for hospital practice

### ■ Creating mechanisms and products for better medical practice

Students from the University and the Kyoto City University of Arts form four mixed groups to propose designs from such perspectives as service, spaces, organizations, and management. They understand the status quo through fieldwork based on their own experiences at hospitals and then pursue new possibilities. Physicians participate along with faculty from the two universities as professors, giving students an opportunity to absorb valuable opinions from the viewpoint of medical practitioners.

### ■ Striving to propose policies and commercialize ideas

In their fieldwork, students make appointments for themselves and visit hospitals to gather information directly. They also work to develop mechanisms and complete productions, including the possibility of making proposals to companies, medical institutions and medical NPOs and working together to commercialize ideas.

### ● Course schedule

1. Introduction	7. Brief presentation of ideas
2. Work on team topics	8. Fieldwork and design
3. Presentation of team topics, mini-lecture, ethnography lecture	9. Interim presentations
4. Fieldwork by teams at medical institutions	10. Fieldwork and design
5. Finalization of topics	11. Final presentation
6. Fieldwork and presentation of designs	

Specialists in information, architecture, medicine, and art join the class.



Group discussion



Picture-card show of students' experiences at the hospital.



### Close-up

## Robots and social design

### ■ Experiencing, building, and operating robots

Students experience service robots, which help realize safe, comfortable lifestyles, by testing personal mobility devices and operating a rescue robot. In addition to understanding robot technology by building a bipedal robot and programming its operation, they discuss issues in commercializing robots while delving into the social and physical constraints and conditions that characterize the settings where such robots are used.

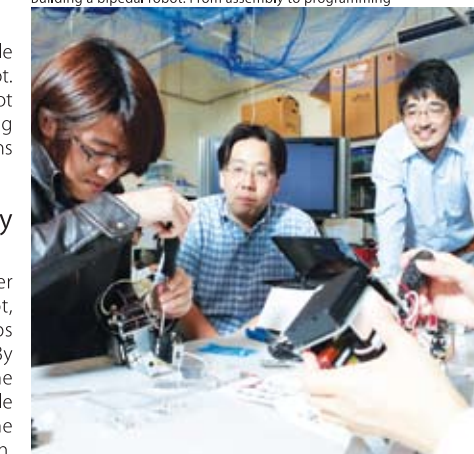
### ■ Polishing their technical and design skills by designing a robot-oriented society

During the second half of the seminar, students are assigned to either the Advanced Design Course, where they build a high-technology robot, or the Social Design Course, where they discuss new relationships between robots and society and propose a commercialization plan. By building a robot with a high level of social value, they explore the characteristics of a society in which robots have become an inseparable part of daily life. During the design development process, they enjoy the support of specialists in areas of engineering, business administration, and industrial design.

### ● Course schedule

1. Overview and lecture	4. Practical sessions (advanced design/ social design)
2. Practical sessions ( building a bipedal robot )	5. Presentations and summary
3. Lecture series	
Rescue robots and universal design	
Ethnography, robots and ventures	

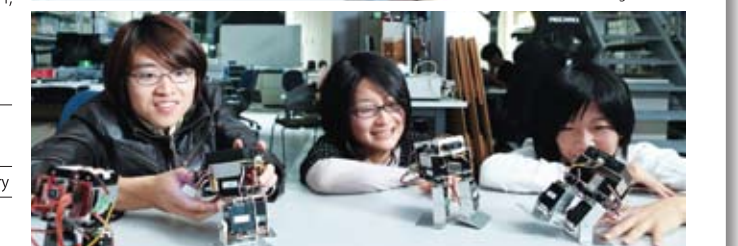
Building a bipedal robot: From assembly to programming



A disaster robot by the Matsuno Lab (used in the aftermath of the Great East Japan Earthquake)



Professor Matsuno talks about building robots.



Students in architecture and information science



# Messages from Industry



**Masatami Takimoto**

C.E.O.,  
Toyota Central  
R&D Labs., Inc.

As is evident by the environmental and energy issues we face, our society and indeed the Earth itself are facing a time of great transformation. To solve the complex challenges posed by these changes requires researchers who have not only insight into a single field of specialization, but also broad perspective and knowledge and the ability to take action. I consider the Collaborative Graduate Program in Design to be a first step toward training researchers who will be responsible for creating the innovation we need to solve the major issues of society, and I hold high expectations for its graduates.



**Kazuhiko Yamamoto**

Senior Adviser,  
Mori Building  
Co., Ltd.

Cities sit at the intersection of an extremely complex set of elements. When these elements are woven together with skill, an exceptional community results, but when they are not, the result is terrible. Urban development projects such as Roppongi Hills require a high level of design skill. I trust that the Collaborative Graduate Program in Design will endow its graduates with high aspirations as well as these skills.



**Bruce MacGregor**

IDEO  
Managing Partner  
Asia

IDEO is excited about the new design program at Kyoto University. The unique and innovative program will provide the students with the experiences to learn and apply a diverse set of design and creative skills to solving today's business and social questions. These are the skills we look for at IDEO and we are looking forward to working together to develop a strong program.

## List of courses in the Kyoto University Collaborative Graduate Program in Design

<b>Design Courses</b> 17 courses	<b>General Design Courses</b>	<b>Credits</b>
	● Design Methodology	2
	● Artifact Design	2
	● Information Design	2
	● Organization and Community Design	2
	● Field Analysis	2
	<b>Practice in Design</b>	
	● Field-based Learning/Problem-based Learning 1	1
	● Field-based Learning/Problem-based Learning 2	1
	● Open Innovation Practice 1	4
	● Open Innovation Practice 2	4
	<b>Internship in Design</b>	
	● Research Internship	2
	● Field Internship	2
	<b>Communication Training in Design</b>	
	● Strategic Communication Seminar (Japanese)	1
	● Strategic Communication Seminar (English)	1
	<b>Skill Training in Design</b>	
	● Informatics Practice I	2
	● Informatics Practice II	1
	● Advanced Studies: Research Methods in Psychology and Design Studies	2
	● Seminar on Research Methods in Psychology and Design Studies	2

\*Communication Training in Design and Skill Training in Design credits do not count toward graduation.

<b>Domain Design Courses</b> <b>Informatics</b> 18 courses *Including 2 new courses	<b>New courses</b>	<b>Credits</b>
	● Design in ICT	2
	● Industrial Mathematics and Design	2
	Existing courses (16)	
	<b>Informatics as a Design Tool</b>	
	● Pattern Recognition, Adv.	2
	● Language Information Processing, Adv.	2
	● Introduction to Algorithms and Informatics	2
	● Transmission Media Engineering, Adv.	2
	● Computational Science for Big Data	2
	● Supercomputing, Adv.	2
	<b>Informatics as a Design Principle</b>	
	● Optimization Theory, Adv.	2
	● Artificial Intelligence, Adv.	2
	● Control Systems Theory, Adv.	2
	● Statistical Systems Theory	2
	● Theory of Symbiotic Systems	2
	<b>Informatics as a Design Experience</b>	
	● Social Informatics	2
	● Information and Intellectual Property	2
	● Information Networks	2
	● Information Systems Design	2
	● Designs for Emergency Management	2

<b>Domain Design Courses</b> <b>Mechanical Engineering</b> 7 courses *Including 1 new course	<b>New courses</b>	<b>Credits</b>
	● Design of Complex Mechanical Systems	2
	Existing courses (6)	
	● Control Theory for Dynamic Systems	2
	● Design and Manufacturing	2
	● Robotics	2
	● Design Systems Engineering	2
	● Engineering Ethics and Management of Technology	2
	● Optimum System Design Engineering	2

<b>Domain Design Courses</b> <b>Architecture</b> 8 courses *Including 2 new courses	<b>New courses</b>	<b>Credits</b>
	● Design Theory of Man-Environment Systems	2
	● Design Theory of Architectural Structure	2
	Existing courses (6)	
	● Theory of Architectural and Environmental Planning	2
	● Design Theory of Architecture and Human Environment	2
	● Theory of Architecture and Environment Design, Adv.	2
	● Design Mechanics for Building Structures	2
	● High Performance Structural System Engineering	2
	● Environmental Control Engineering, Adv.	2

<b>Domain Design Courses</b> <b>Management</b> 6 courses *Including 1 new course	<b>New courses</b>	<b>Credits</b>
	● Business Design	2
	Existing courses (5)	
	● Design Management	2
	● Managing Innovation: From R&D towards New Business Development	2
	● Service Innovation Management	2
	● Marketing Research	2
	● Design Ethnography	2

<b>Domain Design Courses</b> <b>Psychology</b> 7 courses *Including 1 new course	<b>New courses</b>	<b>Credits</b>
	● Cognitive Theory of Design	2
	Existing courses (6)	
	● Seminar on Psychology and Design Studies I	2
	● Seminar on Psychology and Design Studies II	2
	● Seminar on Data Analysis in Psychology and Design Studies	2
	● Design of Cognitive Functions	2
	● Advanced Studies: Cognitive Sciences	2
	● Seminar on Brain Function and Design Studies	2



**Kyoto University Collaborative Graduate Program in Design**  
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