Informatics in Kyoto University is the study of information in natural and artificial systems.

Informatics studies the creation, recognition, representation, collection, organization, optimization, transformation, communication, evaluation and control of information in complex and dynamic systems.

Informatics has human, social, cognitive, biological, linguistic, computational, mathematical and engineering aspects. It includes systems science and communications engineering.

Informatics has close relations with a number of disciplines in the natural and human sciences. It is developed employing contributions from many different areas, in turn, it can contribute to their further development.

Interfaces to human and social areas, mathematical modeling and information systems are the three pillars of Informatics in Kyoto University.
Informatics is a cutting-edge interdisciplinary field for the 21st century which assimilates information with humans and society.
Welcome to the Graduate School of Informatics

The Graduate School of Informatics is committed to its founding mission of cultivating highly talented individuals with broad perspective and insight through the pursuit of pioneering and creative interdisciplinary research and constructive contributions to the field of informatics itself.

YAMAMOTO Akihiro
Dean, Graduate School of Informatics
Foreword
Computers and other information devices have become an integral part of daily life. We now live in an age in which people are more likely to read books or newspapers on a digital tablet than in the traditional formats on printed paper. With the spreading popularity of smartphones, the telephone has evolved into something much more than a device solely for the transmission of voice signals from afar. If you own a digital TV, you have access to a more diverse array of information content and are no longer limited to watching broadcast programs. If you have a smart card with integrated chip technology, you can use it for a wide range of electronic payments, including even bus or train fare. Should you run your own blog, microblog, or video server, you can easily broadcast your own content. And if you use social networking services, you have fresh opportunities to reconnect with old friends. Furthermore, the fusion of varied sensor technologies with information devices facilitates the accumulation of large volumes of data—so-called “big data”—that are harnessed for a range of social, academic, and corporate business activities. These activities in turn generate new data sets that are utilized by downstream activities, feeding a continuous process of development.

Informatics is an academic field that supports human activities of this nature in an increasingly advanced, knowledge-intensive world, and has itself evolved along the way. In this pamphlet for prospective students, I explain the academic discipline of informatics as well as the activities of the Graduate School of Informatics in education and research.

Informatics and the Graduate School of Informatics
In April 1998, Kyoto University created a new graduate school through the reorganization and integration of information-focused research at five faculties (Engineering, Science, Agriculture, Letters, and Integrated Human Studies). Because its scope encompassed such a broad diversity of academic fields, we decided to incorporate the term “informatics” into the name of this new school rather than use the established labels of “information engineering” or “information science.” The Graduate School of Informatics is committed to its founding mission of cultivating highly talented individuals with broad perspective and insight through the pursuit of pioneering and creative academic research from an integrated perspective. The School was founded with a focus in three core areas of study: interfacing humans and society, mathematical modeling, and information systems. To translate this three-pronged focus into action, it launched six departments: Intelligence science and technology, Social informatics, Applied analysis and complex dynamical systems, Applied mathematics and physics, Systems science, and Communications and computer engineering. These departments now promote integrated research in collaboration with an array of other academic fields, including information processing, computer science, digital communications, applied mathematics, biology, cognitive psychology, control engineering, medicine, disaster prevention, environmental sciences, resources, and power generation and electrical engineering.

This pamphlet offers an overview of research activities underway within the Graduate School of Informatics. This graduate school handles over 10 large-scale research projects each year. In addition, among research fields in which Kyoto University is one of the top ten institutions as measured in terms of the number of projects approved for MEXT grants, the Graduate School of Informatics accounts for more than half of all new grant-subsidized projects in more than 10 research fields. These records effectively underscore its role of leadership in the field of informatics research. Indeed, research these days has in general shifted into an entirely new mode compared to the situation back when the School was founded. Some projects, for example, involve research on new applications for basic technologies but with a stronger emphasis on social value. In addition, research has not
been limited to themes centered on the internet or other information and communication technologies. We are also moving forward with projects to broadly apply research findings to, for example, the development of systems for implementation and use in hospital settings and the development of instrumentation to monitor conditions in polar environments. The School has also been energetically involved in collaborative research with private companies, and in many cases the outcomes have been commercialized or led to the development of new products. In FY 2013, the School set up a new laboratory in collaborative research, which has fostered pioneering research in collaboration with four private companies.

The high energy level displayed by its younger researchers is one of the School’s defining hallmarks. Many research projects are being led by young researchers. Additionally, many doctoral students have been selected as research fellows under the Research Fellowships for Young Scientists Program of the Japan Society for the Promotion of Science, thus getting off to a strong start as leaders of the next generation in informatics research.

### Education at the Graduate School of Informatics

Education at the Graduate School of Informatics is focused on training highly qualified engineers and cultivating researchers that will be able to excel within the new academic field of informatics. To help achieve this mission, the School welcomes aspiring students not only from the fields of informatics, electronics, or electrical engineering—divisions and departments with a direct connection to ICT—but also those from a broad range of additional backgrounds, regardless of whether they have a scientific or humanities-based orientation. It also accepts numerous exchange students from abroad and has prepared courses that can be completed without prerequisite Japanese language proficiency, as detailed later. The Doctoral program, moreover, enthusiastically accepts—as professional students—individuals who have completed a master’s degree and are continuing with careers as researchers at private companies or research institutes.

Students that complete the School’s degree programs pursue active careers in a vast range of fields. In addition to filling research positions in universities or corporate research institutes, they also excel as high-level engineers in areas ranging from information and communications technology and manufacturing, to broadcasting, and services.

The Master’s program provides a carefully crafted curriculum of education, which combines a vertical fabric of the six departments’ specialized education with a horizontal fabric of common and advanced courses based on varied education projects as well as education and training projects that involve cooperation with private industry. The specialized education curriculum treats each of the six departments as an independent unit and links diverse areas of research together with the major themes of each department. This educational scope has been further enhanced through the creation of cooperative lecture courses with on-campus research institutes and collaborative units with corporate research houses.

Research activities are an inseparable component of education at the graduate school level, in both Master’s and Doctoral programs. Immediately after enrolling, students take a course in research guidance and begin preparing to write their dissertation papers. While enrolled, most students—even those in the Master’s program—will eventually submit a thesis after gaining experience with giving paper presentations and delivering conference presentations in Japan and abroad. The energy level of student research typically reflects the many awards and commendations that students receive through conferences and other venues in response to their research findings.

The Graduate School of Informatics has been pushing strongly to boost its level of international diversity. Including program-specific faculty positions, the School currently has 11 foreign faculty members, and it offers multiple courses that are taught directly by foreign researchers engaged in the most advanced research as the Interdisciplinary Courses of Perspective on Informatics. Additionally, three departments provide international courses, with many of the courses taught in English. This makes for an environment that allows foreign exchange students to acquire credit without Japanese language mastery and encourages Japanese students to strengthen their awareness of diversity and work with and learn from foreign peers.

Among new education projects, in FY 2012, MEXT launched its Program for Leading Graduate Schools. The Graduate School of Informatics began participating in the Inter-Graduate School Program for Sustainable Development and Survivable Societies that same year, and in FY 2013 it launched the Kyoto University Collaborative Graduate Program in Design. All are degree programs that were created to tie together graduate school Master’s and Doctoral programs, equip qualified students with powers of insight and creativity, and prepare such students for roles as future leaders on the global stage in a broad array of industrial, academic, and public-sector careers. It is anticipated that the study of design in particular will evolve as an academic field forming core foundational technologies for future society, and the Graduate School of Informatics has taken the initiative to help foster this trend. In focusing so much energy on the training of specialists, traditional doctoral degree education programs have drawn criticism for producing sheltered environments and individuals that lack flexibility. Given this image, we are striving to cultivate “+ shaped” (“plus-shaped”) people—individuals that can couple advanced expertise with the broad perspectives that give them the power to design social systems and architectures. To achieve this goal, the Graduate School of Informatics has teamed up with an array of world-leading companies to present real problems to people on the front lines of the development
enterprise and has put emphasis on developing group-led solutions through field-based learning (FBL) and problem-based learning (PBL). Additionally, through collaboration with universities abroad, it has established international internships in corporate workplaces in other nations. On this basis, it aims to cultivate global-scale perspectives.

In FY 2009, the Graduate School of Informatics created an affiliated Center for Promotion of Informatics Education, which in FY 2014 it renamed to Unit for Promotion of Informatics Education. This Center is aimed at students enrolled in not only the Graduate School of Informatics but other faculty and graduate schools as well. It has the purpose of promoting the study, formulation, and implementation of university-wide informatics education programs that will facilitate the cultivation of human resources with knowledge of information science, computer science, information-intensive social systems, and business, as well as the ability to contribute to the pool of human innovation. Graduate-level interdisciplinary courses have been integrated into the curriculum for students at the Graduate School of Informatics as well.

To Students Interested in a Career in Informatics

Informatics is a comprehensive academic field. Specialists in informatics are prepared to make contributions in many areas of academic endeavor and to society at large. To foster effective and efficient research and development work on technologies aimed at aiding responses to and solutions for an array of problems confronting Japan and the wider international community, the 4th Science and Technology Basic Plan currently advocated by the Japanese government cites a need for research and development work on technologies that can be applied in multiple fields. As a specific initiative, it has been proposed that research and development be encouraged in the fields of simulation, e-science, and other forms of advanced ICT as well as mathematical science, systems science technology, and other interdisciplinary technologies that can be utilized in multiple fields. These fields fall precisely within the scope of informatics.

In closing, I want to point out that whenever the accomplishments of informatics are applied to new fields of endeavor, the benefits are not necessarily limited to progress in such fields alone. Frequently, these efforts provide a new perspective that in return enables the field of informatics itself to expand and grow. Achieving growth through that process will demand that students learn independently and interactively, as stated in Kyoto University’s mission statement, firmly assimilate the latest informatics accomplishments, and master necessary skills for the pursuit of research. The Graduate School of Informatics is committed to creating foundations of support for the international society of the future, and it welcomes each and every individual that aspires to aid the advancement of informatics as a young researcher.
Graduate School
## Departments

### Department of Intelligence Science and Technology

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<th>Group</th>
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<td>Cognitive System</td>
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<td>Intelligent media informatics</td>
<td>Language media processing</td>
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<td>Application of Multimedia (Affiliated)</td>
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<td>Bio-system Informatics (Affiliated)</td>
<td>Biological Information Networks</td>
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<td>i-Energy: Smart Energy Management (Joint Research Chair)</td>
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### Department of Social Informatics

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<td>Regional and Disaster Management Information Systems (Affiliated)</td>
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<td>Medical Informatics (Affiliated)</td>
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<td>Information Fluency Education (Affiliated)</td>
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### Department of Applied Analysis and Complex Dynamical Systems

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<td>Nonlinear Dynamics</td>
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<td>Applied Mathematical Sciences</td>
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### Department of Applied Mathematics and Physics

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<td>Mathematical Physics</td>
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<td>Mathematical Finance (Affiliated)</td>
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### Department of Systems Science

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<td>Systems Synthesis</td>
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<td>Systems Informatics</td>
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<td>Applied Informatics (Affiliated)</td>
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### Department of Communications and Computer Engineering

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<td>Radio Atmospheric Sciences (Affiliated)</td>
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