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KYOTO UNIVERSITY
Graduate School of Engineering and Faculty of Engineering 2024

KYOTO UNIVERSITY

Graduate School of Engineering and Faculty of Engineering

2024

京都大学
KYOTO UNIVERSITY

CONTENTS

1 Philosophy and Vision of Kyoto University Engineering

Kyoto University has a mission statement in place with the aim of sustaining and developing the historical commitment to academic freedom, striving to solve pluralistic challenges, and pursuing harmonious coexistence within the global community. To achieve these goals, the Kyoto University Graduate School of Engineering and Faculty of Engineering (Kyoto University Engineering) sets forth its philosophy, objectives , and vision as follows:

Philosophy and Objectives of Kyoto University Engineering

Philosophy

The pursuit of the truth is the essence of learning.
Contained therein is the notion that engineering encompasses all fields of science that make direct or indirect contributions to the lives of people and essentially plays a significant role in the ongoing advancement of the global community and in the progress of civilization. The Graduate School of Engineering and the Faculty of Engineering at Kyoto University, in accordance with the above understanding, is committed to the development of science and technology in harmony with the natural environment, with an emphasis on academic fundamentals and basic principles , as well as to the provision of an education that combines a focus on the attainment of outstanding professional skills and high standards of morality with a balanced approach to acquiring a solid liberal arts education and sense of individuality. In engaging in such research and education, we are mindful of the need to promote ties with local communities and encourage international exchanges. We shall operate the Graduate School and the Faculty based on respect for both the autonomy of the various research and educational bodies under our jurisdiction and the human rights of each person and will respond to the need to be socially accountable with as much effort as we can at all times summon.

Objectives

The Graduate School of Engineering and the Faculty of Engineering consider the nature of engineering and their mission as academic organizations to be as follows.
The mission of the Graduate School of Engineering and Faculty of Engineering is to achieve the abovementioned philosophy while continuing the tradition of an open academic culture that respects the independence of individual members. More specifically, we aim to create and pass on knowledge and technologies derived from free and open-minded intellectual activities.

Vision of Kyoto University Engineering

Integrate basic and applied research, develop the ability to think clearly by learning through research, and remain committed to acting responsibly towards the global community

Research at Kyoto University Engineering

Integrating basic and applied research

Our basic research is intended to deepen the understanding of scientific knowledge by combining experimental studies and mathematical analysis. On the other hand, applied research aims to solve practical problems by applying scientific knowledge. Our tradition at Kyoto University Engineering is to promote research that integrates basic and applied research. Having them complement each other, like the two wheels of a cart, we aim to create scientific technologies that can enable a novel way of manufacturing as well as those that help to bring about a sustainable global community.

Learning at Kyoto University Engineering

Developing the ability to think clearly by learning through research

University-based research is the attempt to do new things. Based on research findings to date, students are expected to set their own research topics and to find their own solutions. Learning at Kyoto University Engineering is about developing the ability to think as well as to educate yourself by learning through research. From time to time you will encounter difficulties. When that happens, you can talk to your fellow students and faculty members, obtain new perspectives or insights from them, and develop your ability to think carefully and solve problems. Kyoto University Engineering is where you can do just that.

Mission of Kyoto University Engineering

Committed to responsibly engaging with the continuous development of the global community

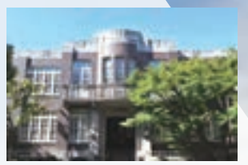
The purposes of engineering are to advance science and technology, to support people’ s lives, and help build an affluent society by sharing the benefits of science and technology. To enable the continuous progress of the global community, it is necessary to develop technologies that can address the various threats to our lives and society and help solve the problems surrounding us. We will continue to map a vision of our future, contribute to the continuous progress of the global community, and remain committed to responsibly promoting the sustainability of the global community.

立川康人
Yasuto Tachikawa
Dean of the Graduate School and Faculty of Engineering
(Professor, Civil and Earth Resources Engineering)

2 History

Kyoto Imperial University was founded on June 18, 1897, and Kyoto University began as the College of Science and Engineering (the predecessor of the College of Science and Engineering). In this sense, the history of Kyoto University is also the history of the Faculty of Engineering. This section looks back on the past and present of Kyoto University's School of Engineering, focusing on the changes in departments and majors.





Kyoto Imperial University established — 1897
College of Science and Engineering established

1897 Civil Engineering and Mechanical Engineering courses established
1898 Electrical Engineering, Mining and Metallurgy, and Manufacturing Science & Technology courses established
1914 College of Science and Engineering divided into College of Science and College of Engineering. Civil Engineering, Mechanical Engineering, Electrical Engineering, Mining & Metallurgy and Industrial Chemistry courses established
1919 College of Engineering became Faculty of Engineering
1920 Architecture & Architectural Engineering course established
1939 Fuel Chemistry course established
1940 Chemical Engineering course established
1941 Textile Chemistry course established
1942 Mining & Metallurgy course divided into Mining and Metallurgy course.Aeronautical Engineering course established
1946 Aeronautical Engineering course abolished, Applied Physics course established

Kyoto Imperial University changed it's name to Kyoto University — 1947

1949
Launch of the new Kyoto University

1953 Graduate School of Engineering established
1954 Electronic Science & Engineering course established
1955 Applied Physics course renamed Aeronautical Engineering course
1957 Department of Nuclear Engineering established
1958 Nuclear Engineering, and Environmental & Sanitary Engineering courses established
1959 Applied Mathematics & Physics course established
1960 Precision Mechanics and Synthetic Chemistry courses established
1961 Electrical Engineering II course and Metal Science & Technology course established.Reorganized/renamed Textile Chemistry course to Polymer Chemistry course.Reorganized Chemical Engineering course
1962 Mechanical Engineering II course established
1963 Transportation Engineering course established
1964 Architecture & Architectural Engineering II courses established and Mining course renamed Mineral Science & Technology course
1966 Reorganized /renamed Fuel Chemistry course to Hydrocarbon Chemistry course
1970 Information Science course established
1975 Mechanical Engineering II course rearranged and renamed to Physical Engineering course
1983 Department of Molecular Engineering established
1987 Department of Applied Systems Science established
1991 Department of Global Environment Engineering established
1993 Reorganization of Chemical Science and Technology system
1994 Reorganization of Engineering Science system
1995 Reorganization of Electrical and Electronic Engineering system . Reorganization two undergraduate courses (Applied Mathematics & Physics, and Information Science) into Informatics & Mathematical Science

Completed prioritization of graduate school — 1996
1996 Reorganization of Civil, Environmental and Resources Engineering system and Architecture and Architectural Engineering system

Katsura Campus established — 2003
2003 Reorganization of Civil, Environmental and Resources Engineering system and Architecture and Architectural Engineering system. Renaming of Electrical and Electronic Engineering system.Electrical and Electronic Engineering system and Chemical Science and Technology system moved to A Cluster
2004 Architecture and Architectural Engineering system moved to C Cluster in Katsura Campus
2005 Reorganized of Engineering Science system
2006 Civil, Environmental and Resources Engineering system moved to C Cluster in Katsura Campus
2013 Engineering Science system moved to C Cluster

Katsura Library established — 2020
2020
2024 Undergraduate Department of Industrial Chemistry renamed Undergraduate School of Chemical Science and Technology.

Civil, Environmental and Resources Engineering system
Faculty of Engineering:
Undergraduate School of Civil, Environmental and Resources Engineering
Graduate School of Engineering:
Department of Civil and Earth Resources Engineering
Department of Urban Management
Department of Environmental Engineering

Architecture and Architectural Engineering system
Faculty of Engineering:
Undergraduate School of Architecture
Graduate School of Engineering:
Department of Architecture and Architectural Engineering

Engineering Science system
Faculty of Engineering:
Undergraduate School of Engineering Science
Graduate School of Engineering:
Department of Mechanical Engineering and Science
Department of Micro Engineering
Department of Aeronautics and Astronautics
Department of Nuclear Engineering
Department of Materials Science and Engineering

Electrical and Electronic Engineering system
Faculty of Engineering:
Undergraduate School of Electrical and Electronic Engineering
Graduate School of Engineering:
Department of Electrical Engineering
Department of Electronic Science and Engineering

Chemical Science and Technology system
Faculty of Engineering:
Undergraduate School of Chemical Science and Technology
Graduate School of Engineering:
Department of Material Chemistry
Department of Energy and Hydrocarbon Chemistry
Department of Molecular Engineering
Department of Polymer Chemistry
Department of Synthetic Chemistry and Biological Chemistry
Department of Chemical Engineering

Establishment of the related Graduate Schools
1996 Graduate School of Energy Science
1998 Graduate Schools of Informatics
2002 Graduate Schools of Global Environmental Studies

Nobel laureates produced by the Graduate School of Engineering
1981 Chemistry Kenichi Fukui (Professor Emeritus)
2001 Chemistry Ryoji Noyori (alumni)
2019 Chemistry Akira Yoshino (alumni)

For a detailed chronology, read more

3 Organization

Kyoto University Engineering has the largest number of Undergraduate Schools and Departments in the University.

(As of April 1, 2024)

(As of April 1, 2024)

Administration Office (Graduate School of Engineering), Katsura Campus

General Affairs Division	Financial Management Division	Accounting Division	Educational Affairs Division	Promotion of Science and Technology Division
General Affairs Section	Financial Affairs Section	Contract Section	Undergraduate Student Section	Research and International Affairs Section
Planning and Public Relations Section	Financial Analysis and Evaluation Section	University Budget and Donation Fund Section	Graduate Student Section	Industry Academia Exchange Section
Personnel Affairs Section	Environment Management Section	Travel Expense and Honorarium Section	Foreign Student Section	Industry Academia Cooperation Section
Academic Information Section	Facility Management Section		Graduate Student Section, A Cluster Office	Governmental Research Grant Section
User Support Section			Graduate Student Section, C Cluster Office	Research Facility Support Section
General Affairs Section, A Cluster Office				
General Affairs Section, C Cluster Office				

(As of April 1, 2024)

Faculty of Engineering — Chairperson of Undergraduate School	Graduate School of Engineering — Chairperson of Department
Undergraduate School of Civil, Environmental and Resources Engineering — Hitoshi Goto	Department of Civil and Earth Resources Engineering — Takashi Yamamoto
	Department of Urban Management — Hideaki Yasuhara
	Department of Environmental Engineering — Tomonari Matsuda
Undergraduate School of Architecture — Ken Miura	Department of Architecture and Architectural Engineering — Makoto Otani
Undergraduate School of Engineering Science — Shigeru Takata	Department of Mechanical Engineering and Science — Ko Hosoda
	Department of Micro Engineering — Yasuhiro Inoue
	Department of Aeronautics and Astronautics — Koji Eriguchi
	Department of Nuclear Engineering — Ikuji Takagi
	Department of Materials Science and Engineering — Hideyuki Yasuda
Undergraduate School of Electrical and Electronic Engineering — Hiroshi Shimoda	Department of Electrical Engineering — Tetsuji Matsuo
	Department of Electronic Science and Engineering — Shingo Yonezawa
Undergraduate School of Informatics and Mathematical Science — Yuichi Nakamura	
Undergraduate School of Chemical Science and Technology — Yo Nakamura	Department of Material Chemistry — Koji Fujita
	Department of Energy and Hydrocarbon Chemistry — Teruyuki Kondo
	Department of Molecular Engineering — Shu Seki
	Department of Polymer Chemistry — Makoto Ouchi
	Department of Synthetic Chemistry and Biological Chemistry — Naoki Ishida
	Department of Chemical Engineering — Ryoichi Yamamoto

(As of April 1, 2024)

Research and Educational Facilities and Centers	Director
Photonics and Electronics Science and Engineering Center	Susumu Noda
Research Center for Environmental Quality Management	Sadahiko Itoh
Quantum Science and Engineering Center	Ikuji Takagi
Katsura Int'tech Center	Takehiko Yokomine
Center for Information Technology	Sadayoshi Murakami
Occupational Health, Safety and Environmental Management Center	Tetsuo Sakka
Engineering Education Research Center	Takeshi Abe
Research Administration Center	Takehiko Yokomine
Interdisciplinary Research Institute for the Next Generation	Takehiko Yokomine


Faceplate of Katsura Campus

Read more

4 Undergraduate Schools of the Faculty of Engineering

Civil, Environmental and Resources Engineering

Rational Development and Conservation of the Earth

Civil, Environmental and Resources Engineering include the various technological divisions and their integrated fields that focus on the resources and energy essential for civilization, as well as advancements in infrastructure that sustainably support society and the maintenance of an environment essential for people to coexist with nature. Based on the think globally and act locally philosophy, this school provides an education that cultivates insight into a comprehensive understanding of a wide range of science and technology. The courses foster ability through advanced research and practical work that encourages rational development as well as the conservation of the planet and the sustainable development of humankind. Also offered is an international course where all lectures are given in English, essential for developing globally minded engineers.

Read more

Architecture

The Pursuit of Human Technologies

Architecture—the way we shape our living environment and the foundation for developing a safe, healthy, and comfortable life—is created by combining diverse technologies. Architecture is considered the technology that is most deeply rooted in all facets of human existence. The Undergraduate School of Architecture welcomes students with a strong interest in the humanities, social sciences, and arts, as well as the natural sciences, helping them to develop their talents. Graduates have gone on to become architects, structural engineers, architectural administration officers, university and corporate researchers, consultants, and planners, among other professions.

Read more

Engineering Science

Cultivating Human Resources for the Creation of New Technologies

The field of engineering science is expected to help resolve issues for traveling in outer space as well as the development of new systems, materials, and energy sources for the 21st century and beyond. To create novel technologies that can meet these needs, the Undergraduate School of Engineering Science provides an education and conducts research that emphasizes the need to gain a firm grasp of the fundamentals. In addition, the five courses—Mechanical and Systems Engineering, Materials Science, Aeronautics and Astronautics, Nuclear Engineering, and Applied Energy Science and Engineering—work together to equip students with a high level of professional competence and a broad perspective.

Read more

Electrical and Electronic Engineering

Science and Technology Supporting Industry and Living Infrastructure

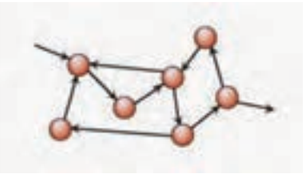
Electrical and electronic engineering not only supports the science and technology essential for industries and the social infrastructure in modern society, it also plays an important role in enriching the 21st century. For this reason, the Undergraduate School of Electrical and Electronic Engineering nurtures individuals with comprehensive knowledge spanning a wide range of fields, a high level of expertise, a multifaceted perspective, exceptional originality, and high ethical standards. The curriculum includes the fundamentals, followed by specialized courses based on the student's own goals. Through these four years of study, students acquire the knowledge and skills necessary to contribute to the advancement of electrical and electronic engineering, while getting a thorough understanding of cutting-edge science and technology.

Read more

Informatics and Mathematical Science

Solving Complex System Problems

Advances in today's information-oriented society have elevated the need to analyze mathematical models that appear in diverse fields, as well as to analyze and use the vast quantities of big data collected by complex information systems. For this reason, it is important to have the mental capacity to investigate not only the function of the system, but also the nature of the "information" that flows through it, and to use that information to create efficient designs. In the Undergraduate School of Informatics and Mathematical Science, students learn to use a mathematical approach to solve real-world problems involving complex systems, as well as to design and use computer hardware, systems software, and information systems.



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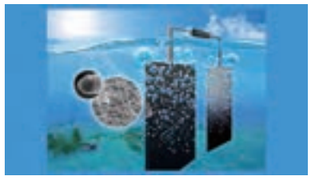
Chemical Science and Technology

Serving as the Foundation for Cutting-Edge Science and Technology

Chemistry is the study of reactions and processes that create various substances, as well as the functions and physical properties of substances. In order to create a sustainable society, the Undergraduate School of Chemical Science and Technology promotes the development of a creative form of basic science and advanced technology, as well as research in interdisciplinary fields, to address global- and space-scale issues. The school provides an education with an emphasis on basic science and engineering in a wide range of chemistry-related fields, and cultivates scientists, researchers, and engineers who can play an active role in various areas of chemistry that support society, such as the creation of materials and their various functions, the use of energy, and the understanding and application of life and biological systems.



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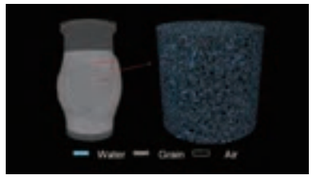
5 Departments of the Graduate School of Engineering

Civil and Earth Resources Engineering

Technological innovation that targets areas where people operate and the social infrastructure is a must for opening up new industries and cultures, harmonizing with the environment, and creating a sustainable society that is safe, secure, and vibrant.
The Department of Civil and Earth Resources Engineering contributes to the development of science and technology to support the growth of the social infrastructure. This Department emphasizes cutting-edge technologies; the realization of safe, secure, and environmentally harmonious social infrastructure; and the sustainable use of underground resources. The Department accomplishes these tasks by focusing on a thorough understanding of global environmental and energy issues, and by equipping students with the fundamental engineering skills needed to pioneer new technologies from an international and multilayered perspective. We also equip students with the skills they need to solve real-world problems.



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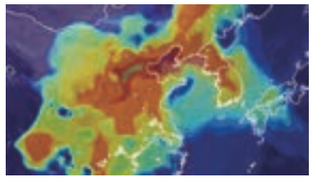
Urban Management

The Department of Urban Management strives to integrate technologies for advanced information and communications as well as social and energy infrastructure to help create an urban social system that can deliver an advanced and abundant quality of life. Specifically, the Department aims to establish the methodology and techniques for analyzing urban activities such as urban engineering, traffic engineering, logistics engineering, and earth resource engineering; urban and transportation planning; upgrading social infrastructures related to lifelines, ground, rivers, etc. to realize safe and sustainable urban systems; and for establishing a new theory of urban energy resources under the concepts of urban governance and urban infrastructure management. The Department also aims to establish the methodology and techniques for comprehensive management of urban systems, including sustainability assessments.

Read more

Environmental Engineering

Global environmental issues, such as climate change, show that the evolution of humanity, once advanced by science, has reached its limitations on a global scale. In addition, there are still societies that have rapidly growing populations and unmet needs for human security, while others are fazed by an aging population and diversifying values. The Department of Environmental Engineering, in response to the demand for solutions to these problems, collaborates with internal and external relevant organizations, faculties, and departments to promote education and research that targets a wide range of environmental fields, from individual living spaces to regional and global ecosystems. This department focuses on resolving apparent and potential regional environmental issues, ensuring healthy environments, creating sustainable global and regional ecosystems, and developing a new environmental science.



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Architecture and Architectural Engineering

Architecture and architectural engineering are multifaceted fields of study that look at humanity by taking on the responsibility for the ongoing evolution of the global environment and the creation of culture. The Department of Architecture and Architectural Engineering works on designing diverse architectural spaces with advanced functionality that are safe and secure, while encouraging the creation of culture. The overall goals are to promote education and advance research in the fundamental fields of planning, structures, and the environment, as well as education and research where students can redefine architecture within the context of natural and living environments in a comprehensive, practical way, while acquiring a wide range of specialized skills and creativity across disciplines, unrestricted by existing specialized fields.

Read more

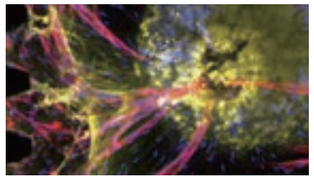
Mechanical Engineering and Science

Mechanical engineering focuses on a broad spectrum of physical systems—from the microscopic to the macroscopic—in order to develop technologies that benefit people in areas related to production systems, energy, the environment, lifestyles, life, living organisms, and medicine. The foundational disciplines are the mechanics of materials, heat, and fluids, as well as solid state physics, mechanical dynamics, vibration engineering, and control engineering. The foundation further requires the application of engineering concepts related to the design, manufacturing, evaluation, diagnosis, and control of mechanical systems and their elements. The Department of Mechanical Engineering and Science conducts research and educates students based on these concepts from a far-reaching perspective that aims for the symbiosis of people and nature. This department also aims to equip engineers and researchers with the ability to define and develop solutions to challenging problems as well as the leadership skills and adaptability to meet the requirements and expectations of society industry and academia.

Read more

Micro Engineering

The Department of Micro Engineering offers an education and research program for equipping researchers and engineers with the ability to research and develop the micro-mechanical systems that are anticipated to be a key driving force behind major changes in communities and lifestyles in the 21st century. Based on a fundamental knowledge of mechanical engineering, microengineering includes quantum engineering, required to clarify physical phenomena specific to the micro range (from the nanometer to micrometer order) and to use the quantum effects expressed at the nanometer level; material and micromachining engineering at the microscopic level to create and process materials; and system engineering and control engineering to build and manipulate nano- and microsystems. As well, this department uses the disciplines required for clarifying the functions of living organisms and for applying molecules and cells by studying living organisms, which are the assemblies of the most precise micromachines.



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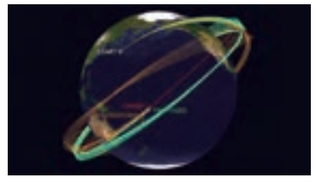
Aeronautics and Astronautics

Research in the Department of Aeronautics and Astronautics is broadly divided into these areas: interaction with the aerospace environment related to spacecraft or aircraft navigation; propulsion and energy; materials and structural strength; and systems and controls. In order to pioneer the frontier of aeronautics and astronautics, fundamental science and engineering are given the highest priority. In other words, our first mission is to expand the possibilities of advanced engineering beyond aeronautics and astronautics. Our second mission is to foster scientific and engineering professionals fully capable of creating original ideas based on in-depth knowledge.



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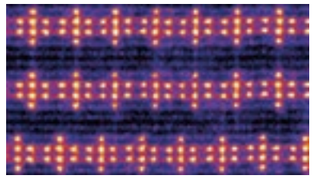
Nuclear Engineering

The Department of Nuclear Engineering pursues the ground-breaking science of quantum technologies, such as quantum beams, nanotechnology, and atom technology from a microscopic viewpoint founded on the science of elementary particles, atomic nuclei, atoms, and molecules. This department also aims to build a circular economy by implementing engineering applications for substances, energy, life, the environment, and other domains. In addition, the Department of Nuclear Engineering cultivates human resources, such as advanced researchers and highly specialized engineers, through education and research that is both systematic and multi-dimensional. This type of research and education contributes to the more prosperous and sustainable growth of society.

Read more

Materials Science and Engineering

Materials science and engineering is the field of study and technology to create novel materials (in particular crystalline hard matter) required for producing new things that do not exist yet. For example, from iron which would rust and decompose if left untreated, the creation of special steels with various exceptional properties, including rust-resistant stainless steel, led to a drastic change of design for machinery and building structures throughout the world. As seen in history to date, the emergence of new materials causes a paradigm shift in the development of innovative technologies. The Department of Materials Science and Engineering promotes diverse fundamental research aimed at the development and practical application of structural and functional materials.



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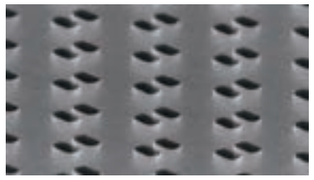
Electrical Engineering

Electrical engineering is a fundamental field of study for the use of electrical and electronic-related technologies in every corner of society. For example, electrical engineering has given us electric vehicles and wind power generation—both expected to contribute to the realization of a decarbonized society. Communications technology is also founded on electrical engineering: electromagnetic waves are producing achievements such as the fifth generation of mobile communications technology, also known as 5G. These are just a few examples of the fields covered by electrical engineering. The Department of Electrical Engineering educates and conducts research in a wide range of fields through four chairs (Advanced Electrical Systems Theory, Fundamentals of Systems, Biomedical Engineering, and Electromagnetics Engineering), as well as a cooperating chair and an endowed chair.

Read more

Electronic Science and Engineering

The Department of Electronic Science and Engineering contributes to society by establishing key technologies that will support optoelectronics for the next generation. The Department proposes new concepts based on the keywords of ***light*** and ***electron*** while promoting education and research that helps create innovative materials and devices based on these concepts. In our quest to find the best way to control light, we are doing world-leading research in many areas. For example, we made short-pulse, high-peak-power photonic crystal lasers that break the rules for conventional semiconductor lasers. We are also uncovering the properties of new wide-bandgap semiconductor materials to design and fabricate power electronics devices that use these materials. And we are elucidating the light emitting mechanism in semiconductors at the nano level as well as their application in highly efficient light emitting devices.



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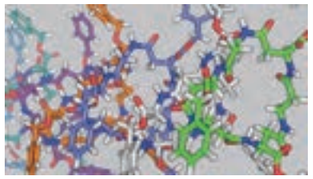
Material Chemistry

Chemistry is evolving into an academic discipline that includes techniques for creating new substances as well as investigations into the background and properties of a substance' s molecules and its unique functions. The research and education provided by the Department of Material Chemistry focuses on inorganic, organic, polymeric, and nanomaterials. The goals are to chemically design materials with novel functions and properties while investigating their structure, properties, and reactivity at the molecular and nano levels as well as establishing the methods for creating these materials. To promote the development of novel functional materials based on integrated science, the department participates in intra- and extradepartmental research exchanges and is developing the framework for more cooperative research.



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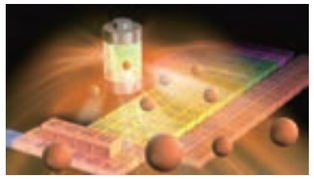
Energy and Hydrocarbon Chemistry

Chemistry is a discipline that clarifies previously unknown phenomena in natural science through experimentation and theory, then establishes new principles. This discipline is responsible for relaying the results in way that is useful to people and society. The Department of Energy and Hydrocarbon Chemistry promotes research into the highly efficient recycling of resources by effectively passing on an understanding of basic chemistry and constructing new scientific principles, then using this understanding as the foundation for creating highly original and academically significant innovative technologies that achieve the extremely efficient conversion of matter and energy. Through these studies, the Department consistently cultivates exceptional students who can independently find and investigate problems, then resolve these problems while maintaining high ethical standards.



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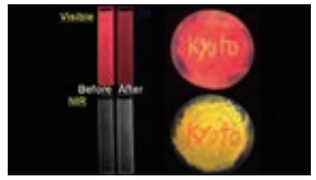
Molecular Engineering

Chemistry, a discipline that deals with converting substances, is steadily growing to include the design of molecules and materials with novel functions. The academic study of a substance helps to determine its properties in relation to electronic structure, molecular arrangement, and interactions. Molecular engineering is a new academic field founded on the fundamental study of microscopic phenomena such as atoms, molecules, and polymers. The ultimate goal is to theoretically and experimentally elucidate the interactions among atoms, molecules, and polymers and then directly apply these results to engineering at the molecular level. The Department of Molecular Engineering conducts fundamental research, from a theoretical molecular perspective, to help develop new electronic materials and other materials for energy and information applications. We cultivate researchers and engineers who can apply innovative ideas to develop these fundamentals into real-world applications.

Read more

Polymer Chemistry

Polymer chemistry is a field of study that merges material science as a fundamental discipline with applied science for practical requirements. This branch of chemistry includes a wide spectrum of fields from a variety of perspectives, including fundamental to applied science, synthesis to physical properties, theory to experiment, organic to inorganic, micro to macro, and so on. The Department of Polymer Chemistry conducts basic research and education on the formation, reaction, structure, properties, and functions of polymers to support fields where advanced applications for polymers are steadily emerging, such as optoelectronics, electronics, information technology, high-performance materials, regenerative medicine, and nanotechnology. The department also contributes to the creation of new science and technology by relaying these achievements to society and by collaborating with related academic fields. The department equips researchers and engineers with the skills necessary to work constructively in advanced polymer-based fields.



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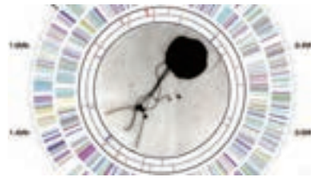
Synthetic Chemistry and Biological Chemistry

The philosophy of the Department of Synthetic Chemistry and Biological Chemistry is to create an interdisciplinary field of synthetic chemistry, or the study of creating a variety of substances and functions, as well as biological chemistry, which clarifies and uses biological functions. We use a close collaboration to establish a highly creative field of chemistry that is comprehensive and precise. The goal of the Chair of Synthetic Chemistry and Chair of Organic System Design is to illuminate the fundamentals and applications of material conversion aimed at efficient synthesis, the functions of inorganic and organic complex molecular assembly systems, and the correlation between the structure of molecules and molecular aggregates as well as their reactivity and physical properties. The goal of the Chair of Biological Chemistry is to understand and control biological phenomena at the molecular level within various hierarchies, such as molecules, systems, cells, and organisms (individuals), as well as to use biological functions and biomaterials to create substances with novel functionality.



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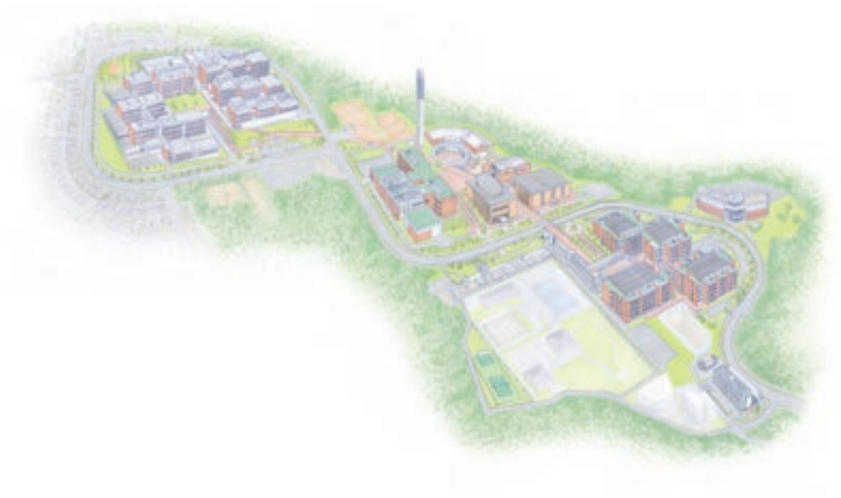
Chemical Engineering

Chemical engineering is a discipline where elemental phenomena are extracted from target processes and quantitatively evaluated to determine their essential nature and dynamic properties. Chemical engineers construct optimal systems, search for methods to improve the functionality of substances and materials, then efficiently produce materials and energy. They create substances and materials that are useful for humankind through chemical conversions, and also propose environmentally friendly and efficient methods for producing substances, materials, and energy. The Department of Chemical Engineering teaches and conducts research on these topics.

Read more



6 Research and Educational Facilities and Centers

Photonics and Electronics Science and Engineering Center

Read more

Towards the Establishment of a Center of Excellence (COE) for Development and Social Implementation of State-of-the-art Photonic/Electronic/Quantum Technologies and the Formation of an Advanced Education and Research Center for Pioneering Academic Science

The purpose of this center is to establish a center of excellence (COE) for development and social implementation of state-of-the-art photonic/electronic/quantum technologies and to establish advanced education and research center for pioneering academic science.

The 21st century has been called the age of photonic, electronic, and quantum technologies. In order to realize the sustainable development in a world with ever-increasing demands for information processing and energy, it is essential to realize a super-smart society (Society 5.0) that highly integrates real space and virtual space, and to achieve carbon neutrality. For this purpose, realization of autonomous driving (smart mobility), smart manufacturing, quantum computation, and energy efficiency are of paramount importance, which require innovations for photonic, electronic, and quantum technologies. By bringing together academic members with education and research backgrounds on basic physics and industrial members with a strong desire for social development, this center aims to establish a COE for development and social implementation of state-of-the-art photonic/electronic/quantum devices that leverage the core technologies for which Kyoto University is globally renowned, such as “photonic crystals,” “photonic nanostructures,” and “wide-bandgap materials” . Furthermore, from 2022, the scope of activities has been expanded even further with a newly endowed course named "Advanced Smart Sensing (Sony Semiconductor Solutions) Course". In addition, this center also plays a role of education in the WISE program “Innovation of Advanced Photonic and Electronic Devices” , where the center aims to build an advanced education and research center for pioneering academic science in the fields of photonics, electronics, and quantum physics, in collaboration with the Graduate School of Informatics and the Graduate School of Science.

Research Center for Environmental Quality Management

Read more

Improving Environmental Quality by Controlling, Evaluating, and Mitigating Harmful Substances

The Research Center for Environmental Quality Management (RCEQM) focuses on environmental quality. The goals are to include engineering research with a more evolved education on the harmful effects of environmental pollutants on people and ecosystems under an integrated collaboration in three areas: control, evaluation, and mitigation. The RCEQM has a unique system for inviting professors from outside of Japan. The expectations for the achievements of the RCEQM are high, considering the increased global awareness of issues that directly affect people and ecosystems combined with the current recognition that even the slightest change to the environment has serious cumulative effects.

Quantum Science and Engineering Center

Read more

Nanoscale Science Research Using Particle Beam Accelerators.

The Quantum Science and Engineering Center (QSEC) contributes to the fields of material science, medicine, energy, and environment using highly functional quantum beams such as ion beams, electron beam, and X-rays from particle accelerators. QSEC uses these resources to observe phenomena at the atomic level and to promote the development of new materials and devices with advanced functionality. Further, the QSEC’ s particle accelerator is widely open to the public to supports advanced education and cutting-edge research. At the nuclear fuel facility, QSEC is working on fundamental research on nuclear fuel cycle technology.

Katsura Int'tech Center

Read more

Innovating Fundamental Engineering Technologies and Inventing New Technologies that Lead the World by Combining Wisdom and Intelligence Across Disciplinary Boundaries.

The Center, with multiple research divisions drawing from various departments and graduate schools, pursues pioneering strategic research and research exchanges with external organizations from a global perspective with great expectations for results. The Center's building, which has three floors above ground and one below, also houses various project groups that explore new engineering possibilities on a daily basis.

Center for Information Technology

Read more

The Construction and Operation of IT Systems for Educational Activities, Research, and Administrative Affairs

The Center for Information Technology was established with the aim of efficiently managing the information systems of the Graduate School of Engineering. The Center is responsible for the construction and management of IT systems for all educational, research, and administrative affairs, as well as for information security management and IT support. The Center also contributes to university-wide information systems by developing novel IT systems.

Occupational Health, Safety and Environmental Management Center

Read more

Ensuring a Comfortable Environment for the People Studying and Working at the Graduate School of Engineering

The aim of the Center is to incorporate the Graduate School of Engineering into an eco-friendly campus for education and research, while fully considering both safety and public health. The Center complies with the Industrial Safety and Health Act and other safety and health-related laws and regulations, while carrying out centralized operations for environmental protection. The Center also supports the education and research of the Graduate School of Engineering by providing faculty and technical staff who have expertise in work and working environment management, as well as health management, through work environment monitoring and systems for handling chemical substances.

Engineering Education Research Center

Read more

The mission of the Engineering Education Research Center is to establish a solid foundation for the future of engineering education by promoting the innovation of engineering education and by strengthening a globally minded education at Kyoto University Engineering. The end goal is to respond effectively to the diverse circumstances surrounding engineering education.

The Center is responsible for Faculty Development (FD) of junior faculty members and common courses for Kyoto University Engineering. To internationalize education at the university and develop global human resources, the Center uses EdTech (educational technology) to offer an advanced education for international students; promotes study abroad and fixed-term overseas study programs for students and young researchers; and proactively and strategically develops international partnerships through the onsite lab system and the double degree program.
The Center also provides common courses for Kyoto University Engineering to foster entrepreneurship with an eye on building stronger ties with society.

Research Administration Center

Read more

Supporting Various Research-Related Tasks.

This center was established to support researchers conducting various research tasks as part of the project titled “Development Project to Foster and Secure Research Administrators” launched by the Ministry of Education, Culture, Sports, Science and Technology (MEXT). We help researchers obtain competitive funding, manage projects, and promote industry-government-academia collaborations.

Interdisciplinary Research Institute for the Next Generation

Read more

Developing Human Resources Capable of Transcending Organizational Boundaries

The Interdisciplinary Research Institute for the Next Generation (iRING) was established in April 2023 to cultivate the researchers who will lead the next generation through the acquisition and practice of new convergence knowledge. By setting up opportunities for interdisciplinary exchange through research, the institute will cultivate the ability of young researchers to think about the 'compatibility of knowledge', integrate individual expertise and knowledge from other fields, and open up new fields.

7 New Developments

Kyoto University's Faculty of Engineering and Graduate School of Engineering conduct innovative research on a daily basis and proactively implement unique activities that contribute to the advancement of education and research. Below are some examples.

Realization of the Techno-Science Hill Katsura Concept, Starting with the Katsura Library

The Graduate School of Engineering is working to realize the Techno-Science Hill Katsura concept in collaboration with the Katsura Library and the URA team at Katsura campus. Specifically, based on the idea of a new library with research support capability, the Katsura Library disseminates the seeds of research at the Katsura Campus through four key channels—exhibitions, website/video content, experimental implementation, and events—with the aim of laying a foundation to spark innovation and establish an industry-academia collaborative network.

Since academic year 2022/23, we have held industry-academia collaboration network events twice a year, including “Me Gene” , an industry-academia collaboration event focusing on women researchers, and “Transform Katsura” , an event for researchers in future generation , held in academic year 2023/24. Me Gene featured research presentations on innovative measurement and data analysis technologies, as well as lectures and discussions on career development with a focus on women's entrepreneurship, whereas Transform Katsura featured research presentations and workshops in the fields of materials, biotechnology, and the environment, with a focus on research and development for social transformation .

Me Gene event leaflet

Transform Katsura event leaflet


Research presentation at Me Gene

Katsura-no-Niwa
Catalogue for Advanced Research of Graduate School of Engineering produced by Katsura Library, Kyoto University

Me Gene:
Industry-Academia Collaborative Network Event supporting the Activities of Women Researchers at Kyoto University

Transform Katsura:
Industry-Academia Collaborative Network Event supporting the Activities of researchers in future generation at Kyoto University

Further Improvement of Undergraduate Education

The Faculty of Engineering holds the Faculty of Engineering Education Symposium as its own faculty development (FD) activity. In academic year 2023/24 it adopted the theme "Changing engineering education to think and create." Information was exchanged and discussions were held on the issues facing university education today and the reasons why education needs to be reviewed.

In 2024, the Undergraduate Department of Industrial Chemistry was renamed for the first time in 110 years, to become the Undergraduate School of Chemical Science and Technology. We continue the department's philosophy of addressing societal challenges by combining fundamental chemistry and engineering, and aim to further advance research in the diverse field of advanced chemistry.


Panel discussion at the symposium


Philosophy of the Undergraduate School of Chemical Science and Technology

The 19th Faculty of Engineering Education Symposium was held on November 22, 2023.

Website of the Undergraduate School of Chemical Science and Technology

Support for the Development of Researchers in future generation

The Graduate School of Engineering has established the Yoshida Research Encouragement Award and the Yoshida Graduation Research and Thesis Award, both funded by a donation from Sanwa Kako Co., Ltd. The former award promotes the research activities and achievements of doctoral students with outstanding qualities. The latter award is for students who have conducted excellent graduation research in their fourth year of studies in the School of Engineering and have entered the Master's Program of the Graduate School of Engineering. In academic year 2023/24, when the fourth and eighth award ceremonies for the former and latter were held, respectively, four third-year doctoral students and 17 first-year master's students received awards. We have also established the Mazume Research Encouragement Award of the Graduate School of Engineering, which provides travel expenses for overseas training, funded by a donation from the family of the late Dr. Akira Mazume, an alumnus of the Graduate School of Engineering. The award provides encouragement to students who have entered the doctoral program, shown outstanding research achievements and character, and intend to train in a developed country in Europe or North America. In academic year 2023/24, the 13th year of the award program, 15 first-year doctoral students received the award, bringing the total number of recipients to 187 since the program was established.

The Shida Scholarship Program was established in academic year 2023/24 in accordance with the wishes of the late Dr. Kozo Shida, a graduate of the School of Engineering. This program supports students and researchers enrolled in the School of Engineering and the Graduate School of Engineering, including doctoral students, to continue their advanced studies in the United States.

The ENEOS Overseas Travel Support Project was launched in academic year 2020/21 with funds donated by ENEOS Holdings, Inc. Students in the School of Engineering and the Master's Program of the Graduate School of Engineering who are traveling abroad to present at international conferences, for research, or for exchange study are eligible for this scholarship. In academic year 2023/24, the project supported eight master's students with travel and other expenses.


Group photo (Yoshida Research Encouragement Award)

The academic year 2023/24 ceremony for the Yoshida Research Encouragement Award was held on July 10, 2023.


Group photo (Yoshida Graduation Research and Thesis Award)

The academic year 2023/24 ceremony for the Yoshida Graduation Research and Thesis Award was held on July 10, 2023.


Group photo (Mazume Research Encouragement Award of the Graduate School of Engineering)

The academic year 2023/24 ceremony for the Mazume Research Encouragement Award of the Graduate School of Engineering was held on July 12, 2023.

Kyodai Collaborative's Shida Scholarship Program

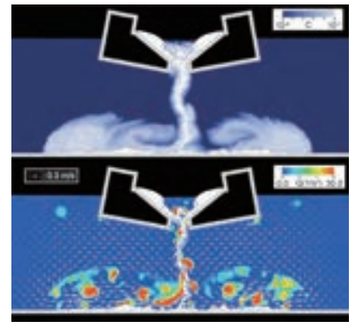
ENEOS Overseas Travel Support Project

Division of Civil, Environmental and Resources Engineering

Major Research Achievements in Academic Year 2023/24

Development of High-Precision Particle Method for Simulating Turbidity Dispersion due to Sediment Input into the Sea

In the construction of large artificial islands such as offshore airports, seawater turbidity is generated when sediment is placed in the sea for reclamation, and from the perspective of preserving the coastal environment, a high degree of turbidity control is desired. The role of turbulence, involving eddies of various sizes induced by the downdraft created by sediment input, is important in the generation of turbidity, and advanced fluid simulation is required to replicate this phenomenon. The figure on the right shows an example of a simulation of sediment placement in the sea for reclamation using the particle method, a calculation method that represents the motion of solids and fluids in terms of the motion of particles. This is the result of the development and application of a new method to calculate turbidity caused by very fine particles, which was not possible with the existing particle method. As in this example, we are developing computational particle methods to solve difficult problems in fluid simulation.

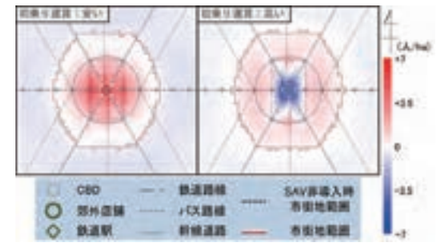

Simulation of sediment placement in the sea for reclamation: distribution of turbidity (C) at the top, and distribution of eddies (Q value) and velocity at the bottom

Read more

Acceptability of Mobility Technology Innovations and Their Urban Implications

Implementing the Compact Plus Network and enabling a lifestyle centered on public transportation is effective in improving health and reducing environmental impact, according to existing research. Optimizing the location of residential, commercial, and medical facilities and improving the convenience of public transportation are key to achieving the Compact Plus Network, and the environment around both these factors is expected to change significantly with the introduction of automated driving technology.

We are therefore conducting research that focuses on the relationship between intention to use automated driving and the experience of using existing driver assistance technologies, as well as the impact of the spread of shared automated driving on residential areas. Based on the knowledge gained from these efforts, we aim to contribute to the realization of sustainable cities that encompass technological innovation.



Change in population distribution when shared fully automated vehicles (SAVs) are introduced (difference from prior to introduction)

Read more

Global Environmental System Course Endowed by Sumitomo Electric Industries Group CSR Foundation

The Global Environmental System Course endowed by Sumitomo Electric Industries Group CSR Foundation was established in the Department of Environmental Engineering, Graduate School of Engineering, Kyoto University on June 1, 2023. The academic staff of the course consists of Professor Shinichiro Fujimori (concurrent post), Program-Specific Associate Professor Tomoko Hasegawa, and Program-Specific Assistant Professor Saritha Sudharmma Vishwanathan. The Global Environmental System Course is so named because its central research theme is the global environment and human systems, and it focuses on the use of models and simulations to generate scientific knowledge and policy recommendations on global environmental issues. The faculty will maximize its expertise to provide a comprehensive analysis of society and the environment, with a focus on developing long-term scenarios specific to each country and examining policies to decarbonize land use and agriculture.


Overall image of simulation models

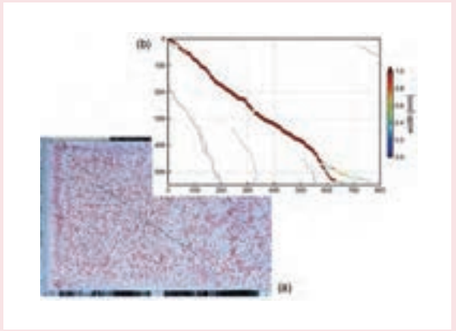
Read more

Division of Architecture and Architectural Engineering

Major Research Achievements in Academic Year 2023/24

High-Precision Crack Measurement Using Image Measurement

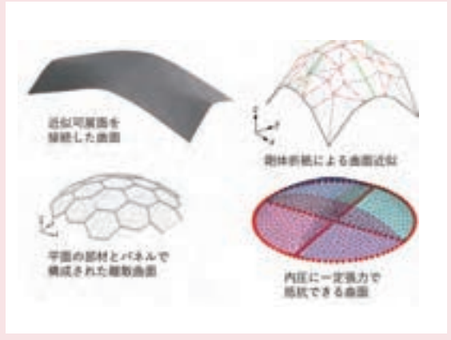
Based on the lessons learned from past earthquake damage, and in response to increasing societal demands for the continued functionality of buildings after earthquakes, accurate seismic damage assessment is becoming increasingly important for the rapid restoration of buildings after earthquakes. However, labor-intensive visual inspection is the main method of checking for cracks, the chief cause of damage in reinforced concrete buildings, and measurements can vary from observer to observer. Therefore, we have studied and established a method of crack measurement using an image measurement technique called digital image correlation. This method is expected to enable crack measurement over a larger area with higher accuracy, thus improving the accuracy of damage assessment for an entire building.



(a) Crack generated during experiment; and (b) crack width measured by image measurement
The experimental observation that cracks widen mainly in the center is consistent with the trend of the image measurement results.

Creating Architectures with Superior Design and Mechanical Performance at Low Cost

Complex buildings such as exhibition halls and stadiums used for major sporting events require not only good design, but also high structural performance that can efficiently withstand external forces such as earthquakes. It is also socially important to be able to build such special structures at low cost. Therefore, we are developing a method for designing curved surface structures using limited elements such as expandable surfaces that can be created by bending flat surfaces, panel structures that can be expanded into flat surfaces or folded, and discrete structures that can be constructed using flat members and finishing materials. To this end, we propose new methods for optimizing the total performance of building structures using differential geometry, structural optimization, machine learning, and other techniques.

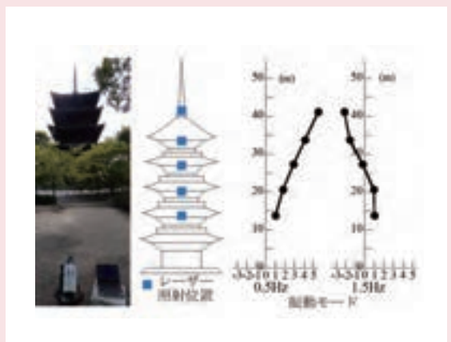


Examples of architectural surfaces that consider total performance

Read more

Non-Contact Evaluation of Vibration Characteristics of Traditional Wooden Buildings

There are still a lot of traditional wooden buildings in Kyoto, such as temples and shrines. However, if an earthquake occurs along one of Kyoto's many active faults, there is a possibility of extensive damage to buildings near the hypocenter. Therefore, it is important to evaluate the earthquake resistance of traditional wooden buildings to prepare for coming earthquakes. Vibration characteristics determined from small vibrations of buildings not felt by humans are helpful in evaluating the seismic performance of traditional wooden buildings, but the installation of sensors may not be feasible from the perspectives of protecting cultural assets or the time and effort required. Therefore, we tried non-contact vibration measurement by irradiating a laser beam onto buildings from the outside and confirmed that the vibration characteristics of a large traditional wooden building could be evaluated even from distances of 50 m or more. Accordingly, this method is expected to be useful for rapid evaluation of earthquake resistance performance.



Example of evaluating the vibration mode of a five-storied pagoda

Division of Engineering Science

Major Research Achievements in Academic Year 2023/24

Establishment of Endowed Interdisciplinary Course in Mechanical Engineering

We are pleased to announce that Kyoto Seisakusho Co., Ltd. has made a generous donation to support human resource development in the field of mechanical engineering, with the aim of promoting the development of outstanding young researchers and, in turn, contributing to the creation of new value and the resolution of social issues through cooperation with industry. This donation will be used to establish an endowed interdisciplinary course in June 2024. This course aims to foster outstanding researchers who have the sense of being not only academic researchers, but also corporate researchers. It will promote basic research that will lay the foundation for the future development of mechanical engineering, and train and produce excellent researchers and engineers who can carry out development and collaborate across organizational boundaries. In doing so, the course will connect university knowledge with industry to create new value and solve societal problems.

From left: Yasuto Tachikawa (Dean, Graduate School of Engineering, Kyoto University), Kyoko Inagaki (Executive Vice-President, Kyoto University), Nagahiro Minato (President, Kyoto University), Susumu Hashimoto (Representative Director and Chairman and CEO, Kyoto Seisakusho), Kihei Kinoshita (Representative Director and President and COO, Kyoto Seisakusho), and Toshiyuki Onishi (Managing Executive Officer, Kyoto Seisakusho) at the press conference on January 31, 2024

Read more

Predictive Control of Fusion Plasma by Digital Twin

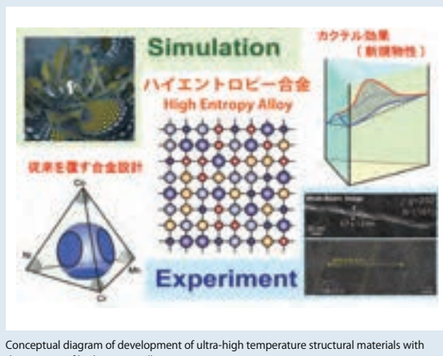
To realize fusion power generation using magnetic confinement, it is necessary to control ultra-high temperature plasma exceeding 100 million degrees Celsius for prolonged periods. However, predicting and controlling the complex behavior of fusion plasma is challenging, mainly because it is difficult to create accurate prediction models, or digital twins. Therefore, we developed a predictive control system based on a mathematical technique called data assimilation and demonstrated its control capability.
The system predicts and controls future plasma states while bringing the model closer to the behavior of real plasma by observations.
We will extend the system to serve as a foundation for fusion reactor control and apply it to more advanced control problems.

Digital twin control of fusion plasma

Read more

Development of Novel Ultra-High Temperature Structural Materials with the concept of High Entropy Alloys

Significant reductions in carbon dioxide emissions are needed to suppress global warming. With up to one-third of total carbon dioxide emissions coming from thermal power plants, there is a need to increase the efficiency of power plants and improve their thermal efficiency. To this end, the plant operating temperatures must be increased, and the development of ultra-high temperature materials with dramatically improved heat resistance is essential. While alloys that are strong at high temperatures usually have the disadvantage of being brittle at low temperatures, we have succeeded in developing new ultra-high temperature structural materials with high-temperature strength and low-temperature toughness, which are expected to have practical applications in power plants. This development was achieved based on the novel concept of high entropy alloys, in which unexplored composition spaces are investigated by combining experiments with theoretical calculations and mechanical property simulations.



Conceptual diagram of development of ultra-high temperature structural materials with the concept of high entropy alloys

Read more

Division of Electrical and Electronic Engineering

Major Research Achievements in Academic Year 2023/24

Development of SCSC Cable (High-Temperature Superconducting Collective Conductor) Capable of Carrying Kiloampere-Class AC Current

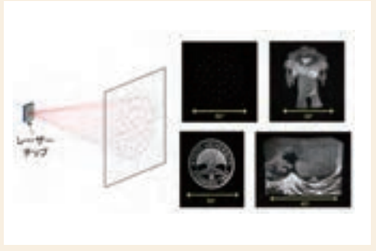
We have developed a high-temperature superconducting conductor called the SCSC cable, in which finely split high-temperature superconducting filaments are spirally wound in multiple layers around a metal core, and have succeeded in transmitting alternating current of about one kiloampere. We confirmed that compared to the traditional high-temperature superconducting filament, the current lost when exposed to alternating magnetic field is ten times smaller when the SCSC cable is used.
Since the SCSC cable can be bent in any direction, it can also be wound into coils of various shapes. The SCSC cable is expected to contribute to carbon neutrality through applications such as superconducting motors for electric propulsion of aircraft and superconducting magnetic energy storage devices that enable a stable supply of electric power even when large amounts of renewable energy are introduced.

SCSC cable
(Top: conceptual diagram; bottom: enlarged view of an actually fabricated 5 m long SCSC cable)

Read more

Generation of Various Beam Patterns with Photonic Crystal Lasers

Photonic crystal lasers (PCSELs), a new semiconductor laser with compact size, high efficiency, and high functionality, are expected to contribute to the realization of Society 5.0, the ultra-smart society typified by smart mobility and smart manufacturing. The Department of Electronic Science and Engineering (Noda Lab), in collaboration with the Photonics and Electronics Science and Engineering Center, has developed PCSELs with high output and extremely narrow spread angle, which can contribute to the advancement of LiDAR sensing and laser processing. More recently, we have also succeeded in developing PCSELs that can directly emit a variety of beam patterns.
This achievement is expected to lead to various developments, including ultra-compact sensing systems, increased processing flexibility, and lighting and entertainment applications.



Schematic diagram of a PCSEL capable of directly emitting various beam patterns, and examples of emission patterns.
We successfully generated beam patterns including multi-dot patterns, the mascot for EXPO 2025 Osaka, the Kyoto University logo, and one of the Thirty-Six Views of Mt. Fuji.

Website of Noda Lab

PCSEL-COE

Newly Developed Quantum Entangled Light Source Enabling the World's Widest Ultra-Broadband Quantum Infrared Spectroscopy

Quantum sensing is being explored to push the limits of conventional measurement techniques. In particular, quantum infrared spectroscopy using quantum entangled light is a new technology that enables infrared spectroscopy using only a light source and detector in the visible range. The Department of Electronic Science and Engineering (Takeuchi Lab), in collaboration with Shimadzu Corporation, has developed an ultra-broadband quantum entangled light source that generates infrared photons in a wide wavelength range from 2 μm to 5 μm, and has achieved the world's first quantum infrared spectroscopy using this light source. In the future, compact, high-performance quantum infrared spectrometers using silicon photodetectors, which are also used in smartphone cameras, are expected to be developed for use in medicine, security, environmental monitoring, and other applications, and we are seeking collaborative research partners in this regard.

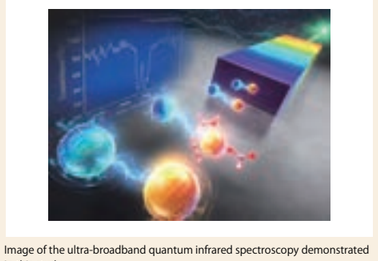


Image of the ultra-broadband quantum infrared spectroscopy demonstrated in this study

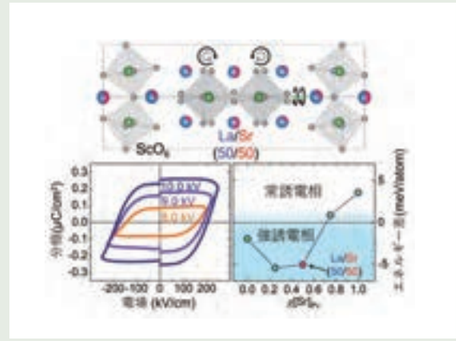
Read more

Division of Chemical Science and Technology

Major Research Achievements in Academic Year 2023/24

Discovery of Novel Ferroelectric Layered Perovskite

Ferroelectric materials based on perovskite-type oxides, such as barium titanate ($BaTiO_3$) and lead zirconate titanate ($Pb(Zr,Ti)O_3$), are currently in practical use. In such ferroelectrics, the inversion symmetry of the crystal structure is broken by off-centering cation displacements due to electronic phenomena such as an enhanced covalent bonding between constituent cations and anions, or a lone-pair effect. Nevertheless, such chemical bonding effects limit the scope for designing new ferroelectrics and so only a small proportion of perovskite oxides are noncentrosymmetric. In this study, we found that in a layered oxide $La_2SrSc_2O_7$, which is composed of alternating rock-salt and perovskite layers, nonelectronic geometric effects, like rotation and tilting of oxygen octahedra to induce cation displacements, gives rise to ferroelectricity.



Ferroelectricity induced by disordered La/Sr distribution in layered perovskite oxide $La_2SrSc_2O_7$

Read more

How Do Gate-type Adsorbents Capture Gas Molecules?

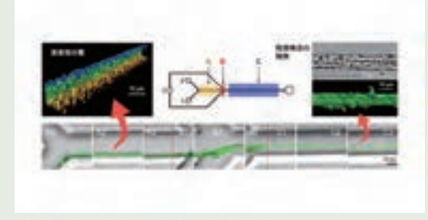
Gate-type adsorbents, which are currently attracting attention as innovative adsorbents, deform their own structure to capture gas molecules such as CO_2 at a certain threshold pressure. This phenomenon is known as gate adsorption, but the understanding of its dynamic process has been limited. In this study, we focused on the close relationship between the kinetic equation of chemical reaction and the mechanism of the reaction, and came to believe that the dynamic process of gate adsorption could be elucidated by formulating the rate of structural deformation. Using state-of-the-art analysis at SPring-8, a large synchrotron radiation facility, we clarified the softness of the skeletal structure and the way gas molecules are incorporated. This outcome brings us one step closer to the achievement of a highly efficient and energy-saving adsorptive separation and recovery system using gate-type adsorbents.

Elucidating dynamic processes by sub-second X-ray diffraction measurements

Read more

Replicating Spider Silk Formation Using Microfluidic Channels: Accurately Mimicking Biological Processes Using Microfluidic Device

We have designed and developed a microfluidic system that allows spidroin, the protein that makes up spider silk, to be formed into fibers, successfully mimicking the spinning mechanism that spiders achieve in nature.
Our microfluidic device can control ion exchange, pH, and shear stress, and induces spidroin' s self-assembly under aqueous conditions, enabling the formation of fibers with hierarchical structure. By increasing the shear stress during the spinning process, more of the beta-sheet structure responsible for the strength of spider silk was formed from spidroin. This research has been accomplished through an interdisciplinary approach that combines various aspects of biochemistry, fluid mechanics, polymer science, and computational modeling. The results of the research are expected to contribute significantly to the development of technologies for the production of high-performance and environmentally friendly polymer and fiber materials.



Microfluidic channels allow replication of spider fiber formation processes from liquid-liquid phase separation to fiber formation.

Read more

8 International Exchanges

Kyoto University Engineering promotes international exchanges for education and research that contribute to the global community through academic studies and research. The goals of these exchanges are working to advance science and technology in harmony with nature with a focus on basic research; developing human resources equipped with high levels of expertise and ethical standards; providing an excellent education; and nurturing originality.

As of May 1, 2024

- Partner institution
- Overseas research base
- Kyoto University–Tsinghua University Cooperative Research and Education Center for Environmental Technology (CRECET), an onsite laboratory of Kyoto University

Scan this QR code for more information on international exchange agreements and international partner institutions (academic exchange agreements and student exchange agreements).

Europe (including new independent states) (9)	Partner institution (17)	Academic exchange agreements	Student exchange agreements
United Kingdom	University of Birmingham, School of Engineering, etc.	●	
Netherlands	Delft University of Technology	●	
Switzerland	ETH Zurich (Swiss Federal Institute of Technology Zurich)		●
Sweden	Linköping University	●	●
Czech Republic	Czech Technical University in Prague	●	
Germany	Heinrich Heine University Düsseldorf, Institute of Organic Chemistry and Macromolecular Chemistry	●	●
	Technical University of Dortmund, Faculty of Biochemical and Chemical Engineering	●	●
	University of Freiburg, Faculty of Engineering		●
	University of Freiburg, Department of Microsystems Engineering (Tri-party agreement to which the University of Michigan in the United States is also a party)	●	
Norway	Norwegian University of Science and Technology	●	
France	ENSAPLV (École nationale supérieure d'architecture de Paris-La Villette)	●	●
	Pierre and Marie Curie University (Paris VI) →Merged into Sorbonne University	●	
	University of Rennes, Sciences and Properties of Matter (SPM) and Rennes School of Engineering (ESIR)	●	●
	University of Rennes, Lannion IUT		●
	IPGP (Institut de physique du globe de Paris)	●	
	EPHE (École pratique des hautes études)	●	●
Poland	AGH University of Science and Technology	●	

Middle East (1)	Partner institution (1)	Academic exchange agreements	Student exchange agreements
United Arab Emirates	United Arab Emirates University, Colleges of Science and Engineering	●	

Africa (2)	Partner institution (2)	Academic exchange agreements	Student exchange agreements
Egypt	American University in Cairo, School of Sciences and Engineering	●	
Kenya	Jomo Kenyatta University of Agriculture and Technology	●	●

Asia (8)	Partner institution (18)	Academic exchange agreements	Student exchange agreements
India	National Institute for Interdisciplinary Science and Technology (NIIST)	●	
Indonesia	Brawijaya University, Faculty of Engineering	●	●
Thailand	Asian Institute of Technology, School of Engineering and Technology , etc.		●
	King Mongkut's University of Technology Thonburi (KMUTT) (Joint Graduate School of Energy and Environment: JGSEE)	●	
	King Mongkut's Institute of Technology Ladkrabang (KMITL)	●	
	Mahidol University, Faculty of Engineering		●
Korea	Kyung Hee University, College of Engineering	●	
	Korea Institute of Construction Technology	●	
Taiwan	National Cheng Kung University, College of Engineering	●	
China	Dalian University of Technology	●	
	Graduate School of Tongji University	●	
	City University of Hong Kong, College of Science, College of Engineering		●
	Graduate School of Southeast University	●	●
	Tianjin University, School of Science	●	
	Chinese University of Hong Kong, Shenzhen (CUHK-Shenzhen), School of Science and Engineering	●	●
	Jilin University	●	
Viet Nam	Hanoi University of Civil Engineering	●	
Malaysia	University of Technology Malaysia, Faculty of Built Environment and Surveying, etc.	●	

Joint Workshop with ENSAPLV
(École nationale supérieure d'architecture de Paris-La Villette)

Students majoring in architecture and architectural engineering join ENSAPLV students in Paris for field research, discussions, and presentations, each time under a specific theme.



Highlights of the Walking Survey in Paris

International Internship Program


TUD students at a post-internship debriefing

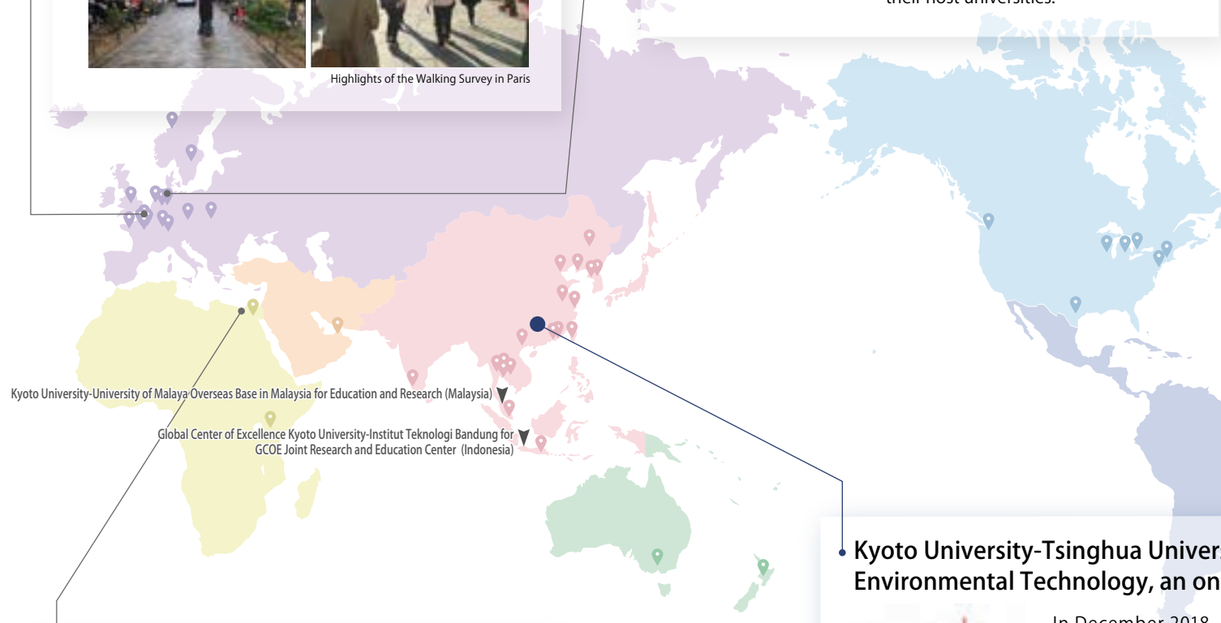

Dortmund city center

In partnership with the Technical University of Dortmund (TUD) in Germany, since 1990 we have offered an international internship program for students majoring in chemical engineering. Japanese and German students participate in internships at companies in each other's country for two months, with program coordinators at TUD making arrangements for Kyoto University students and those at Kyoto University for TUD students. After orientations, the interns work at companies, then submit final reports, and have their credits recognized by their host universities.

North America (2)	Partner institution (7)	Academic exchange agreements	Student exchange agreements
United States	University of Wisconsin-Madison, College of Engineering	●	
	University of Washington, College of Engineering	●	
	University of Texas at Austin, Cockrell School of Engineering	●	
	Rensselaer Polytechnic Institute, School of Engineering	●	
	University of Michigan, College of Engineering (Tri-party agreement to which the University of Freiburg in Germany is also a party)	●	
	City University of New York, Energy Institute	●	
Canada	University of Western Ontario, Faculties of Engineering and Science	●	

Central and South America (1)	Partner institution (1)	Academic exchange agreements	Student exchange agreements
Brazil	University of São Paulo, School of Engineering	●	

Oceania (2)	Partner institution (2)	Academic exchange agreements	Student exchange agreements
Australia	Royal Melbourne Institute of Technology	●	
New Zealand	Victoria University of Wellington, Faculties of Science, Engineering, and Architecture and Design Innovation, Robinson Research Institute, and Ferrier Research Institute	●	●



Egypt-Japan University of Science and Technology (E-JUST)

In collaboration with the Japan International Cooperation Agency (JICA), we support Egypt-Japan University of Science and Technology (E-JUST), a joint project by the Japanese and Egyptian governments.


Visit to E-JUST

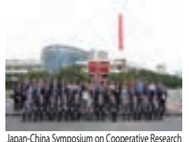

Summer seminar on advanced microchemistry

Kyoto University WISE Program:
Innovation of Advanced Photonic and Electronic Devices

We offer a five-year doctoral program designed to produce international leaders in fields related to advanced photonic and electronic devices. Students are leaders with a strong sense of responsibility and a high level of ethical standards, working under the common philosophy of "challenging physical limits and developing an information-oriented and energy-saving society."


International Seminar Dojo

Kyoto University-Tsinghua University Cooperative Research and Education Center for Environmental Technology, an on-site laboratory of Kyoto University


Japan-China Symposium on Cooperative Research and Education in Environmental Technology


Signing ceremony for the founding of CRECET

In December 2018, Kyoto University-Tsinghua University Cooperative Research and Education Center for Environmental Technology (CRECET) was designated as an onsite laboratory of Kyoto University with the aim of solving environmental problems through joint education and research in the area of environmental engineering. In collaboration with Tsinghua Shenzhen International Graduate School, CRECET promotes the research and development of environmental technologies needed to achieve a sustainable society, while at the same time acting as a liaison office to enable joint research with external partners, such as private-sector businesses. A double master's degree program between the two universities was launched in academic year 2022/23. CRECET also is an internship site for Kyoto University students and a contact point for Tsinghua University students searching for internship opportunities in Japan.

Number of international students

Undergraduate	Graduate	Doctoral
124	110	278

Total 512

As of May 1, 2024

Number of international research students

Research students	Special auditing students	Special research students	Short-term exchange students
14	19	8	5

Total 46

As of May 1, 2024

Number of international scholars

Guest scholars	Guest research associates	Visiting research scholars
19	63	3

Total 85

Academic year 2023/24

Scan this QR code for figures by country and region.

Scan this QR code for exchange agreements between Kyoto University and international partner institutions.

9 Kyoto University Engineering Fund

This section provides an overview of the Kyoto University Engineering Fund set up by Kyoto University Engineering. Using this fund, we intend to improve the research infrastructure and amenities at the beautifully scenic Katsura Campus—dubbed "Techno-Science Hill Katsura"—as well as nurture a high level of expertise and a wealth of creativity for the engineers who will help shape the future.

About the Kyoto University Engineering Fund

We believe that the mission of Kyoto University Engineering is to contribute to the creation and development of environmentally conscious scientific knowledge as well as technologies to build a brighter future. We adhere to our educational philosophy: understanding underlying scientific principles and theories is essential for largescale applications and developments into the future.

Guided by this mission, Kyoto University Engineering strives to develop young, high-caliber engineering talent with advanced expertise firmly based on fundamental knowledge, rich creativity, and a sense of dignity.

As of 2023, it has been 20 years since the Graduate School of Engineering moved to the Katsura Campus. Situated in rich natural surroundings, the Katsura Campus is spacious and beautiful. However, it is not well equipped with amenities, such as dormitories, and the distance between the Yoshida and Katsura Campuses, where the Graduate School of Informatics and the Graduate School of Engineering are located, has made it difficult to pursue education and research.

The Kyoto University Engineering Fund was set up to overcome this situation by all available means.

Using this fund, we will improve the existing information exchange network and science education facilities at the Katsura Library, as well as other amenities, in this way creating and maintaining an environment that supports the development of future leaders of engineering by enabling students and researchers in future generation to concentrate on their research and extracurricular activities.

We would like to ask for your kind donations and support for Kyoto University Engineering.

Examples of use of the Kyoto University Engineering Fund

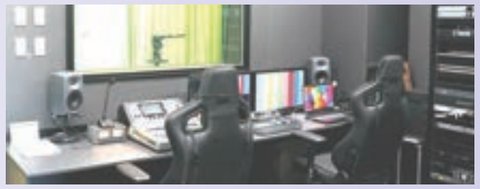
Support for students to participate in a short-term training program in the United States

Kyoto University Engineering has launched a short-term overseas training program for students to help them take the first step toward becoming internationally minded. In academic year 2022/23, the Kyoto University Engineering Fund provided, by covering their travel expenses, support to 11 students for a short-term training program in the United States.

Facilities for the Katsura Library of Kyoto University

The Katsura Library, which opened in April 2020, has been updated with new facilities including rare book storage racks and a studio inside the media creation room.

As a result, we can now preserve valuable data and materials for the Graduate School of Engineering. As well, faculty and students are provided with new ways of presenting and disseminating their research findings, such as creating video content.



Uses of the Kyoto University Engineering Fund

Educational support	• Virtual reality (VR) for use in safety training and pre-experiment briefings • Development of teaching tools capable of multilingual translation • Study rooms that are available 24 hours a day • Enhanced learning environments for undergraduates, such as active learning rooms
Construction and renovation of amenities	• Improved amenities, including building a dormitory for international and Japanese students, as well as a fitness center • Subsidies for operating the School Nurse Office for students' mental and physical healthcare
Construction and renovation of research infrastructure	• Functional improvements of the Katsura Library • More advanced information networks • Promotion of open data
Training and development of researchers in future generation	• Subsidies for the Seiran Program, a training program for faculty members in future generation • Financial support for researchers in future generation , subsidizing the cost of long-term stays overseas • Financial support for the launch of new research projects
International exchanges	• Accommodations for international researchers • Establishment and operational support of onsite laboratories as well as the promotion of international exchanges
Industry-university collaboration	• Collaboration with local communities • Support for startup ventures

How to Donate

You can donate online or via a bank transfer.

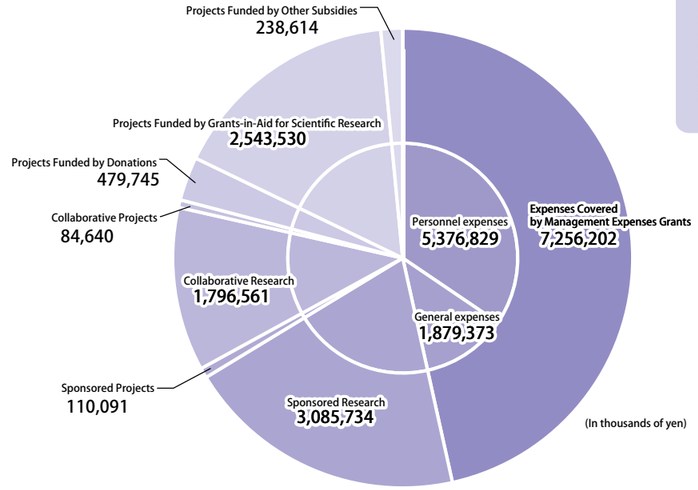
For further details,
please see the Kyoto University Engineering website.

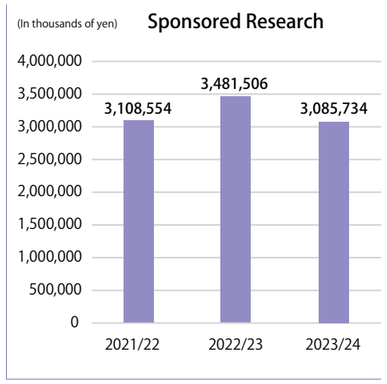
10 Financial Status

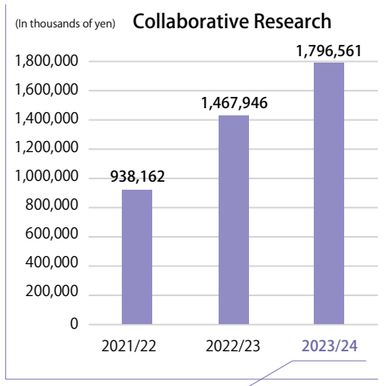
As a unit within Kyoto University, the Graduate School of Engineering has one of the biggest budgets. Operating expenses in academic year 2023/24 are outlined below.

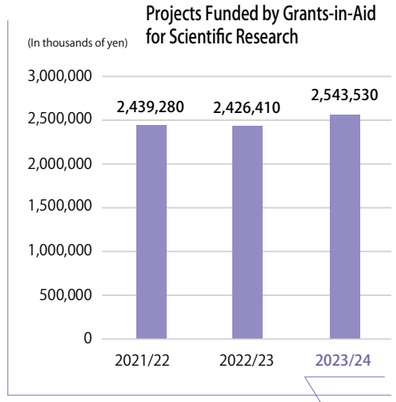
Operating expenses in academic year 2023/24

Category	Amount (in thousands of yen)
Expenses Covered by Management Expenses Grants	7,256,202
Personnel expenses	5,376,829
General expenses	1,879,373
Sponsored Research	3,085,734
Sponsored Projects	110,091
Collaborative Research	1,796,561
Collaborative Projects	84,640
Projects Funded by Donations	479,745
Projects Funded by Grants-in-Aid for Scientific Research	2,543,530
Projects Funded by Other Subsidies	238,614
Other Large-scale Projects	0
Total	15,595,117

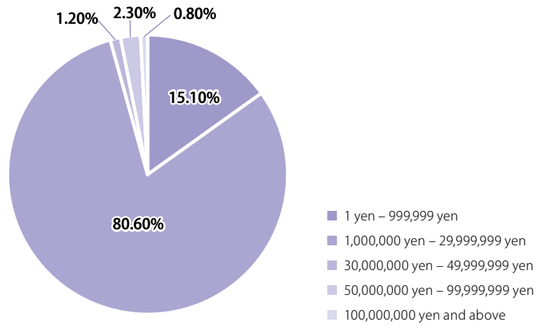








Collaborative Research in 2023/24 by Size of Expenses



Projects Funded by Grants-in-Aid for Scientific Research in 2023/24 by Type of Grant

Type of Grant	Number of projects	Amount (in thousands of yen)
Grant-in-Aid for Specially Promoted Research	4	627,250
Grant-in-Aid for Scientific Research on Innovative Areas / Grant-in-Aid for Transformative Research Areas (A) and (B)	32	370,760
Grant-in-Aid for Scientific Research (S)	6	212,550
Grant-in-Aid for Scientific Research (A), (B), and (C)	186	896,610
Grant-in-Aid for Early-Career Scientists	70	111,890
Grant-in-Aid for JSPS Fellows	97	94,240
Others	62	230,230
Total	457	2,543,530

Statistics Data

Number of academic and administrative staff

Academic Staff

(Black: Katsura Campus, Blue: Yoshida Campus, etc.) As of May 1, 2024

Departments & Centers	Professor	Associate professor	Senior lecturer	Assistant professor	Total
Department of Civil and Earth Resources Engineering	14 (4)	12 (2)		13 (1)	39 (7)
Department of Urban Management	10 (2)	10		6	26 (2)
Department of Environmental Engineering	5 (1)	6 (1)	1	9 (1)	21 (3)
Department of Architecture and Architectural Engineering	15	9	1	10	35
Department of Mechanical Engineering and Science	11	6	4	9	30
Department of Micro Engineering	6	4	3	5	18
Department of Aeronautics and Astronautics	6	3 (1)	1	2	12 (1)
Department of Nuclear Engineering	6	3	3	4	16
Department of Materials Science and Engineering	9	10	1	16	36
Department of Electrical Engineering	7	2	3	4	16
Department of Electronic Science and Engineering	6	8	1	7	22
Department of Material Chemistry	7	4	1	12	24
Department of Energy and Hydrocarbon Chemistry	9	9	3	10	31
Department of Molecular Engineering	5 (1)	4	1	9	19 (1)
Department of Polymer Chemistry	6 (1)	5	1	8 (2)	20 (3)
Department of Synthetic Chemistry and Biological Chemistry	8	6	4	9	27
Department of Chemical Engineering	8	6	1	10	25
Photonics and Electronics Science and Engineering Center		1	1	2	4
Research Center for Environmental Quality Management	1	1		1	3
Quantum Science and Engineering Center		2			2
Katsura Int'tech Center					
Center for Information Technology			[2]		[2]
Occupational Health, Safety and Environmental Management Center		[1]	[1]		[2]
Engineering Education Research Center	1		6		7
Total	140 (9)	111 (4) [1]	36 [3]	146 (4)	433 (17) [4]
Katsura Campus Total	130 (9)	98 (4) [1]	35 [3]	129 (4)	392 (17) [4]
Yoshida Campus, etc. Total	10	13	1	17	41

Note 1: ( ) The numbers in parentheses indicate the number of academic staff belonging to Graduate School of Global Environmental Studies, Graduate School of Management and Institute for Liberal Arts and Sciences, in addition to the regular figures.
Note 2: [ ] The numbers in parentheses indicate the personnel who are officially classified to other sections, in addition to the regular figures. Note 3: Including Specially Contracted Fixed-Term Faculty

Administrative Staff

(Black: Katsura Campus, Blue: Yoshida Campus, etc.) As of May 1, 2024

Departments and Undergraduate Schools	Administrative Staff	Technical Staff	Program-Specific Researcher	Total
Department of Civil and Earth Resources Engineering	2	3	1	6
Department of Urban Management	3	1		4
Department of Environmental Engineering		2	4	6
Department of Architecture and Architectural Engineering		2	2	4
Department of Mechanical Engineering and Science	2	5	2	9
Department of Micro Engineering	2	1	4	7
Department of Aeronautics and Astronautics			1	1
Department of Nuclear Engineering		1		1
Undergraduate School of Civil, Environmental and Resources Engineering				
Undergraduate School of Architecture				
Department of Materials Science and Engineering	2	4	2	8
Undergraduate School of Engineering Science				
Department of Electrical Engineering			3	3
Department of Electronic Science and Engineering			3	3
Department of Material Chemistry	2		5	7
Department of Energy and Hydrocarbon Chemistry	3	2	7	12
Department of Molecular Engineering	4		1	5
Department of Polymer Chemistry		1		1
Department of Synthetic Chemistry and Biological Chemistry	3	3		6
Department of Chemical Engineering	6	1	3	10
Undergraduate School of Electrical and Electronic Engineering				
Undergraduate School of Chemical Science and Technology				
Undergraduate School of Informatics and Mathematical Science		1		1
Research Center for Environmental Quality Management			3	3
Quantum Science and Engineering Center	1			1
Katsura Int'tech Center		2		2
Center for Information Technology		3		3
Occupational Health, Safety and Environmental Management Center		4		4
Administration Office (Graduate School of Engineering), Katsura Campus: located in Katsura	106	3		109
Administration Office (Graduate School of Engineering), Katsura Campus: located in Yoshida	23			23
Total	159	39	41	239
Total for Katsura Campus	133	34	36	203
Total for Yoshida Campus, etc.	26	5	5	36

Note: Including Specialist Administrative Staff, Re-employed Staff and Support Staff

Number of students

Graduate Students

(Black: Katsura Campus, Blue: Yoshida Campus, etc.) As of May 1, 2024

Departments	Master's Program		Doctoral Program						Total	
			Year 1		Year 2		Year 3			
	Year 1	Year 2	April	October	April	October	April	October	April	October
Department of Civil and Earth Resources Engineering	79	81	18	5	11	5	18	6	207	[16]
Department of Urban Management	53	51 [1]	19	7	18	8	16	5	157	[21]
Department of Environmental Engineering	32 [1]	42	11	9	5	6	8	5	98	[21]
Department of Architecture and Architectural Engineering	71	90	11	2	8	8	25	8	205	[18]
Department of Mechanical Engineering and Science	52	60	11	5	9	3	16	4	148	[12]
Department of Micro Engineering	33	38	8	1	4		10	3	93	[4]
Department of Aeronautics and Astronautics	22	23	2		4		4		55	
Department of Nuclear Engineering	24	24	2		7	2	11		68	[2]
Department of Materials Science and Engineering	43	45	3		13	3	8	2	112	[5]
Department of Electrical Engineering	34	42	2	1	3		6	3	87	[4]
Department of Electronic Science and Engineering	37	35	3	1	8	1	8		91	[2]
Department of Material Chemistry	26	28	7		6		5		72	
Department of Energy and Hydrocarbon Chemistry	40	40	16	2	15		14	1	125	[3]
Department of Molecular Engineering	33	33	8		7	1	11	2	92	[3]
Department of Polymer Chemistry	43	43	10	2	13	1	9		118	[3]
Department of Synthetic Chemistry and Biological Chemistry	26	29	5	2	9	2	10	4	79	[8]
Department of Chemical Engineering	39	33	5	2	3	1	8	1	88	[4]
Total	687 [1]	737 [1]	141	39	143	41	187	44	1,895	[126]
Total for Katsura Campus	644 [1]	692 [1]	138	39	130	38	179	42	1,783	[121]
Total for Yoshida Campus, etc.	43	45	3		13	3	8	2	112	[5]

Note: The numbers in parentheses indicate the number of Master's Course students enrolled in October, in addition to the regular figures.

Undergraduate Students

As of May 1, 2024

Undergraduate Schools	Year 1	Year 2	Year 3	Year 4	Total
Undergraduate School of Civil, Environmental and Resources Engineering	186	182	185	232	785
Undergraduate School of Architecture	82	81	82	96	341
Undergraduate School of Engineering Science	243	239	241	296	1,019
Undergraduate School of Electrical and Electronic Engineering	132	133	133	177	575
Undergraduate School of Informatics and Mathematical Science	92	92	93	133	410
Undergraduate School of Chemical Science and Technology	242	243	242	307	1,034
Total	977	970	976	1,241	4,164

Admission for Academic Year 2024/25

Graduate School

Departments	Master's Program		
	Quota	Applicant	Freshperson
Department of Civil and Earth Resources Engineering	58	151 [29]	79 [10]
Department of Urban Management	57		53 [8]
Department of Environmental Engineering	36	38 [6]	33 [5]
Department of Architecture and Architectural Engineering	75	88 [10]	71 [7]
Department of Mechanical Engineering and Science	59		52 [1]
Department of Micro Engineering	30	130 [4]	33
Department of Aeronautics and Astronautics	24		22 [1]
Department of Nuclear Engineering	23	30 [4]	24 [4]
Department of Materials Science and Engineering	38	50 [3]	43 [3]
Department of Electrical Engineering	38	95 [6]	35 [1]
Department of Electronic Science and Engineering	35		37 [2]
Department of Material Chemistry	29		26 [2]
Department of Energy and Hydrocarbon Chemistry	39		40 [5]
Department of Molecular Engineering	35	207 [19]	33 [2]
Department of Polymer Chemistry	46		43 [2]
Department of Synthetic Chemistry and Biological Chemistry	32		26
Department of Chemical Engineering	34	47 [1]	39 [1]
Total	688	836 [82]	689 [54]

Note: The numbers in parentheses indicate the number of foreign students, in addition to the regular figures.

Departments	Doctoral Program		
	Quota	Applicant	Freshperson
Department of Civil and Earth Resources Engineering	17	25 (5) [15]	*23 (5) [13]
Department of Urban Management	17	27 (7) [14]	26 (7) [14]
Department of Environmental Engineering	10	20 (4) [13]	20 (4) [13]
Department of Architecture and Architectural Engineering	22	15 (3) **[8]	14 (3) **[8]
Department of Mechanical Engineering and Science	16	***17 (4) [5]	***17 (4) [5]
Department of Micro Engineering	7	9 (2) [2]	9 (2) [2]
Department of Aeronautics and Astronautics	7	2	2
Department of Nuclear Engineering	9	3 [1]	2
Department of Materials Science and Engineering	10	3	3
Department of Electrical Engineering	10	4 (2)	3 (2)
Department of Electronic Science and Engineering	10	4 (2) [3]	4 (2) [1]
Department of Material Chemistry	9	7 [2]	7 [2]
Department of Energy and Hydrocarbon Chemistry	11	21 (2) [8]	18 (2) [5]
Department of Molecular Engineering	10	9 (2) [3]	8 (2) [2]
Department of Polymer Chemistry	15	13 (2) [5]	12 (2) [4]
Department of Synthetic Chemistry and Biological Chemistry	10	7 [2]	7 [2]
Department of Chemical Engineering	7	7 (1) [1]	7 (1) [1]
Total	197	193 (36) [82]	182 (36) [72]

Note 1: The numbers in parentheses ( ) and [ ] indicate the number of specially selected career-track working students and foreign students, respectively, and both are included in the regular figures.
Note 2: The numbers of applicants and freshpersons are respectively the sum of those applied in October, 2023, and those applied in April, 2024.
* An applicant who had originally applied to the Department of Urban Management eventually entered the Department of Civil and Earth Resources Engineering due to the transfer of a supervisor .
** One of the privately-financed international students to the Department of Architecture and Architectural Engineering is a specially selected career-track working student.
*** One of the general (Japanese) applicants to the Department of Mechanical Engineering and Science is a successful applicant to the transfer examination.

Undergraduate School

Undergraduate Schools	Quota	Applicant	Freshperson		
			Male	Female	Total
Undergraduate School of Civil, Environmental and Resources Engineering	185	528 [29]	156 [1]	30 [6]	186 [7]
Undergraduate School of Architecture	80	331 [6]	66	16	82
Undergraduate School of Engineering Science	235	860 [15]	231 [7]	12	243 [7]
Undergraduate School of Electrical and Electronic Engineering	130	402 [21]	126 [2]	7	133 [2]
Undergraduate School of Informatics and Mathematical Science	90	381 [3]	87 [1]	6	93 [1]
Undergraduate School of Chemical Science and Technology	235	389 [13]	200 [2]	43 [4]	243 [6]
Total	955	2,891 [87]	866 [13]	114 [10]	980 [23]

Note 1: The numbers in parentheses [ ] indicate the number of foreign students, and are included in the regular figures.
Note 2: The numbers of applicants are counted for their first choice.

Graduation/Completion and the number of individuals awarded a degree

Graduate School

Departments	Master's Program		Doctoral Program
	Academic Year 2023/24	Total sum	As of May 1, 2024 Total number of those who withdrew from research guidance approval
Department of Industrial Chemistry		1,263	212
Department of Hydrocarbon Chemistry		758	137
Department of Synthetic Chemistry		582	163
Department of Mechanical Engineering		1,154	78
Department of Physical Engineering		462	38
Department of Mechanical Engineering and Science		212	6
Department of Precision Engineering		860	56
Department of Metallurgy		634	47
Department of Metal Science and Technology		567	43
Department of Energy Science and Engineering		57	2
Department of Aeronautical Engineering		388	32
Department of Electronic Science and Engineering		227	15
Department of Electrical Engineering II		730	67
Department of Electrical Engineering		110	2
Department of Applied Mathematics and Physics		785	84
Department of Information Engineering		508	44
Department of Applied System Science		342	10
Department of Civil Engineering		1,996	143
Department of Transportation Engineering		598	14
Department of Civil Engineering Systems		240	23
Department of Earth Resources Engineering		681	40
Department of Sanitary Engineering		620	54
Department of Environmental Engineering		205	8
Department of Global Environment Engineering		501	30
Department of Architectural Engineering		514	51
Department of Architecture and Environmental Design		159	17
Department of Material Chemistry	30	835	39
Department of Energy and Hydrocarbon Chemistry	40	1,078	76
Department of Molecular Engineering	35	1,130	71
Department of Polymer Chemistry	52	2,280	295
Department of Synthetic Chemistry and Biological Chemistry	37	901	89
Department of Chemical Engineering	37	1,715	131
Department of Nuclear Engineering	20	1,285	167
Department of Materials Science and Engineering	39	1,098	25
Department of Electrical Engineering	43	1,719	117
Department of Electronic Science and Engineering	31	1,473	102
Department of Architecture and Architectural Engineering	72	2,543	209
Department of Civil and Earth Resources Engineering	72	1,274	65
Department of Urban Management	55	1,128	55
Department of Environmental Engineering	37	1,060	54
Department of Mechanical Engineering and Science	57	1,036	55
Department of Micro Engineering	30	475	32
Department of Aeronautics and Astronautics	21	572	33
Total	708	36,755	3,031

Number of Doctoral Graduates

Type		Doctor of Engineering
Old University System	According to the degree law before June, 1920	42[28]
	According to the degree law after July, 1920	1,338
New Education System	By completing the doctorate courses	5,271
	By submitting doctorate thesis	4,215
Total		10,866[28]

As of May 1, 2024

Note: The numbers in parentheses [ ] indicate the number of doctors based on recommendation, and are included in the regular figures.

Undergraduate School

Undergraduate Schools	Academic Year 2023/24	Total sum
Department of Civil Engineering		3,222
Department of Mechanical Engineering		2,122
Department of Electrical Engineering		2,112
Department of Mining		357
Department of Mineral Science and Technology		1,073
Department of Metallurgy		1,532
Department of Industrial Chemistry		2,125
School of Architecture		2,207
Department of Fuel Chemistry		443
Department of Hydrocarbon Chemistry		1,296
Department of Chemical Engineering (before 1961)		295
Department of Chemical Engineering (after 1961)		1,244
Department of Polymer Chemistry		1,225
Department of Textile Chemistry		250
Department of Applied Physics		116
Department of Electronic Engineering		1,606
Department of Aeronautical Engineering		810
Department of Nuclear Engineering		714
Department of Environmental and Sanitary Engineering		1,390
School of Applied Mathematics and Physics		1,448
Department of Precision Engineering		1,379
Department of Synthetic Chemistry		1,259
Department of Electrical Engineering II		1,447
Department of Metal Science and Technology		1,220
Department of Mechanical Engineering II		505
Department of Transportation Engineering		1,284
School of Architectural Engineering		1,149
School of Information Science		1,037
School of Engineering Science		480
(new) Undergraduate School of Chemical Science and Technology	241	6,268
(new) Undergraduate School of Engineering Science	233	6,101
Undergraduate School of Electrical and Electronic Engineering	132	3,297
Undergraduate School of Informatics and Mathematical Science	92	2,215
Undergraduate School of Civil, Environmental and Resources Engineering	179	4,456
(new) Undergraduate School of Architecture	82	1,971
Total	959	59,655

Foreign Students, Guest Scholars

Number of Foreign Students

As of May 1, 2024

Country/Region	Undergraduate School	Graduate School		Total
		Master's Program	Doctoral Program	
Asia (18)				
India	1		5	6
Indonesia	10	2	14	26
Cambodia	1			1
Singapore	2		1	3
Sri Lanka	2		2	4
Thailand	3	4	11	18
Korea	11	6	17	34
Taiwan	7	4	11	22
China	69	81	164	314
Nepal			1	1
Pakistan			1	1
Philippines	3	2	2	7
Bhutan		1		1
Vietnam	2	1	5	8
Hong Kong		1	2	3
Malaysia	2		2	4
Myanmar	6		4	10
Mongol	2			2
Middle East (4)				
Iran			3	3
Oman		1		1
Saudi Arabia			1	1
Syria			2	2
Africa (8)				
Algeria			2	2
Uganda			1	1
Egypt		1	3	4
Cameroun			1	1
Kenya		1	3	4
Tanzania			1	1
Tunisia			2	2
Madagascar			1	1
Oceania (3)				
Australia		1		1
Solomon Islands			1	1
Fiji		1		1
North America (2)				
United States of America	1		2	3
Canada	1	1	1	3
Latin America (5)				
El Salvador			1	1
Colombia			2	2
Chile			1	1
Brazil	1		2	3
Peru		1		1
Europe (including NIS countries) (7)				
Uzbekistan			1	1
United Kingdom			1	1
Greece		1		1
Spain			1	1
Germany			1	1
France			1	1
Portugal			1	1
Total (47 countries/regions)	124	110	278	512

Number of International Research Students

Country/Region	Research Student	Special Auditing Student	Special Research Student	Short-term International Student	Total
Asia (9)					
India	1		1		2
Indonesia			1		1
Cambodia	1				1
Singapore		1			1
Thailand			1		1
Korea	3	1			4
Taiwan	1				1
China	5	2	3		10
Vietnam	1				1
Africa (1)					
Malawi	1				1
Oceania (1)					
Australia		1			1
North America (1)					
United States of America		1			1
Latin America (1)					
Brazil	1				1
Europe (including NIS countries) (7)					
Italy		1			1
Switzerland		1			1
Sweden		2			2
Germany		2	1		3
Norway		1			1
France		6	1	4	11
Belgium				1	1
Total (20 countries/regions)	14	19	8	5	46

As of May 1, 2024

Number of Guest Scholars

Academic Year 2023/24

Country/Region	Guest Scholar	Guest Research Associate	Visiting Research Scholar	Total
Asia (9)				
India	3	3		6
Indonesia		2		2
Thailand		1		1
Korea	2	4	1	7
Taiwan		1		1
China	7	19		26
Pakistan		2		2
Bangladesh		1		1
Hong Kong	1			1
Middle East (1)				
Iran		1		1
Africa (2)				
Egypt		1		1
Ethiopia	1	6		7
Oceania (1)				
Australia	2			2
North America (2)				
United States of America	1	1	1	3
Canada		1		1
Europe (including NIS countries) (11)				
Italy		1		1
Ukraine	1			1
United Kingdom		3		3
The Netherlands		2		2
Greece		1		1
Spain		1		1
Tajikistan		1		1
Germany		8		8
France		3		3
Belgium	1			1
Poland			1	1
Total (26 countries/regions)	19	63	3	85

Book (Number of books)

Library Collection

As of May 1, 2024

Library Name	Book (Number of books)			Magazine (Number of titles)		
	Japanese	International	Total	Japanese	International	Total
Katsura Library	125,133	194,359	319,492	2,472	5,451	7,923
The North Library, Graduate School of Engineering and Faculty of Engineering	10,222	1,418	11,640	24	4	28
The South Library, Graduate School of Engineering and Faculty of Engineering	27,251	27,047	54,298	824	773	1,597
Total	162,606	222,824	385,430	3,320	6,228	9,548

Research Students

Number of Research Students and others

Departments/ Undergraduate Schools	Research Student	Research Fellow	Special Auditing Student	Special Research Student	Short-term International Student	Total
Department of Civil and Earth Resources Engineering	1 [1]	2	4 [4]			7 [5]
Department of Urban Management	4 [4]			1 [1]		5 [5]
Department of Environmental Engineering	1					1
Department of Architecture and Architectural Engineering	8 [4]	2 [1]	5 [5]	2 [1]	1 [1]	18 [12]
Department of Mechanical Engineering and Science	1			12 [5]		13 [5]
Department of Micro Engineering			1 [1]			1 [1]
Department of Aeronautics and Astronautics						
Department of Nuclear Engineering	1 [1]					1 [1]
Department of Materials Science and Engineering						
Department of Electrical Engineering	1 [1]	1	2 [2]			4 [3]
Department of Electronic Science and Engineering	1 [1]	5				6 [1]
Department of Material Chemistry	1 [1]	2		3		6 [1]
Department of Energy and Hydrocarbon Chemistry	1 [1]	1				2 [1]
Department of Molecular Engineering				1		1
Department of Polymer Chemistry		1				1
Department of Synthetic Chemistry and Biological Chemistry						
Department of Chemical Engineering			2 [2]	2 [1]		4 [3]
Undergraduate School of Civil, Environmental and Resources Engineering						
Undergraduate School of Architecture						
Undergraduate School of Engineering Science						
Undergraduate School of Electrical and Electronic Engineering			2 [2]			2 [2]
Undergraduate School of Informatics and Mathematical Science			3 [2]			3 [2]
Undergraduate School of Chemical Science and Technology			1 [1]		4 [4]	5 [5]
Total	20 [14]	14 [1]	20 [19]	21 [8]	5 [5]	80 [47]

As of May 1, 2024

Note 1: The numbers in parentheses [ ] indicate the number of foreign students, and are included in the regular figures.

Note 2: The number of Research Fellows includes the numbers of Research Fellows, entrusted researchers, and research fellows of the Japan Society for the Promotion of Science (PD).

Access Map

Check the web for further access☞

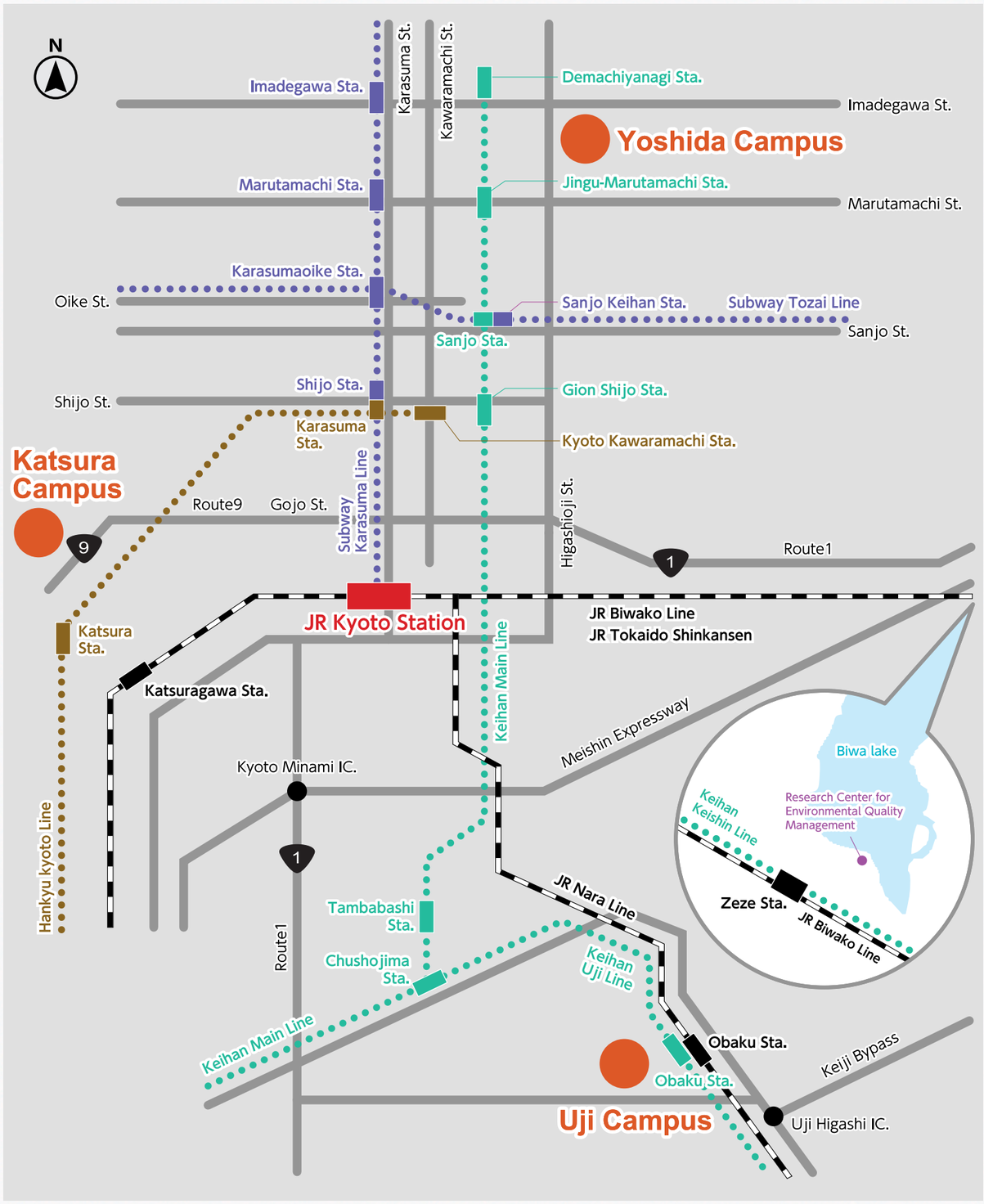
Engineering HP

Kyoto University HP

Access from International Airports

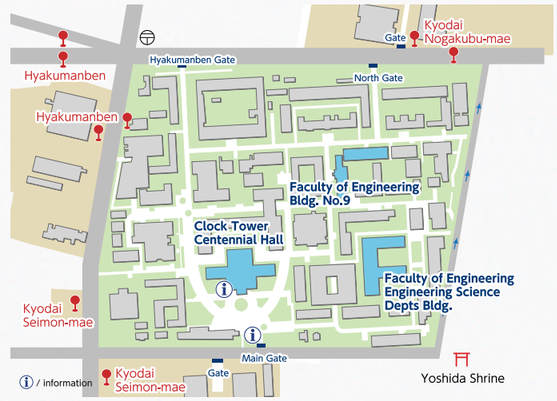
JR Kyoto Station

- Airport Limousine Bus, Approx. 50 min. ⟷ Osaka International Airport (Itami)
- JR Airport Express "Haruka", Approx. 75 min. / Airport Limousine Bus, Approx. 105 min. ⟷ Kansai International Airport
- Keihan Kyoto Kotsu Bus: No. 21 or 21A, Get off at "Kyodai Katsura Campus-mae", Approx. 45min. / Taxi: Approx. 35 min. → Katsura Campus
- Hankyu Railway Katsura Sta. → Keihan Kyoto Kotsu Bus: No. 20 or 20B; City Bus: West No. 6; Get off at "Kyodai Katsura Campus-mae", Approx. 12 min. / Taxi: Approx. 10 min. → Katsura Campus
- City Bus: No. 206, Get off at "Kyodai Seimon-mae", Approx. 30 min. / Taxi: Approx. 30 min. → Yoshida Campus
- Local Train: JR Nara Line, Get off at "Obaku", Approx. 20-25 min. → Uji Campus



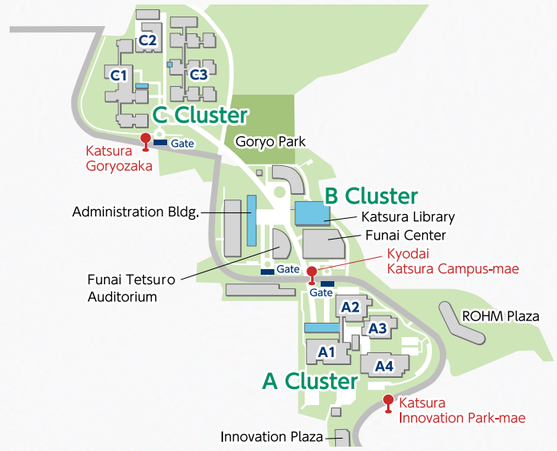
Kyoto University Yoshida Campus

Yoshida-Honmachi, Sakyo-ku, Kyoto 606-8501



Kyoto University Katsura Campus

Kyoto Daigaku-Katsura, Nishikyo-ku, Kyoto 615-8530



Kyoto University Uji Campus

Gokasho, Uji, Kyoto 611-0011