Welcome to Graduate School of Science and School of Science, Osaka University

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Thanks to the remarkable advancement of technologies in the past century, human beings have acquired comfortable living and longevity that have never been experienced for generations. Modern technologies have been developed on the basis of the crop of fundamental scientific research that has been an intellectual activity of human beings for generations purely from curiosity. Progress in Science has produced new technologies, one after another, which have contributed to the creation of modern civilization.

No matter how technologies are advanced, we lead our lives surrounded by nature. The study of Science begins when we start asking “Why?” about nature. The targets for the quest may range from things we can see, touch, and listen to in our daily life, to the microscopic world we cannot see with the naked eye or to the endlessly vast space we cannot even imagine. Generation after generation, human beings have made a challenge to find the answer to the “Why” questions and have unraveled the underlying truth of nature.

With all the advancement of basic science in the past century, however, we have had only a glimpse of nature. As we know more and more about nature, we will venture further into new and unknown worlds. Thus, the subjects of purely basic scientific research are unlimited.

The study of Science at the Graduate School of Science and School of Science, Osaka University, includes a variety of disciplines, as can be seen from such diverse Departments as Mathematics, Physics, Chemistry, Biological Science, Macromolecular Science, and Earth and Space Science, affording a wide range of research topics for graduate study. The tradition at our School of Science, since its foundation in 1931, is academic freedom with emphasis on the quest for the truth of nature.

This booklet is intended to introduce you to the Graduate School of Science and School of Science, Osaka University. Inquiries for further information are welcome and may be directed to the individual Departments. For those students considering graduate studies at the Graduate School of Science, Osaka University, I thank you for your interest.
History of Graduate School of Science and School of Science

The School of Science in Osaka University was established with the School of Medicine, at the same time that the Osaka Imperial University was founded as the sixth Imperial University in Japan in 1931. At that time, there were new ideas and thoughts spreading in Osaka, a commercial capital in Japan that played a pivotal role in industry. It was thought that industrial technologies copied from Western Europe should be converted to new industry with creative technologies produced from original, fundamental studies. Understanding that a base for educational research on basic science was needed in Osaka for the coming future, local people in Osaka including economic and financial specialists strongly requested that the School of Science should be established. It is said that local people covered all the expenses for the first three years including the funds for establishing the science department without receiving any aid from the government. This demonstrates the pride and spirit of the people of Osaka, who established "Kaitoku-do" and "Teki-jyuku," both of which were famous educational institutes in Japan during the Edo era (1603-1868).

Regarding one of its characteristic points, the School of Science in Osaka University has been paying a lot of attention to industries, even when it was based on the investigation of fundamental scientific principles. In order to meet the needs of requests from society at any time, the School of Science was not only concerned with fundamental research studies but also concerned with practical applied research studies. This traditional principle has continued and has been passed on to the next generation.

The Graduate School of Science began accepting graduate students from universities under the old educational systems in 1933 and at the same time its education and research instructions started. The Departments of Mathematics, Physics and Chemistry all began accepting graduates students at the same time of their establishment, while the Department of Biology began doing so in 1952. In 1953, the Graduate School of Science was reestablished with new systems and was composed of 8 departments: 1 Department of Mathematics, 3 Departments of Physics, 2 Departments of Chemistry and 2 Departments of Biology. Students in the master's course entered the Graduate School of Science in 1953, while students in the doctorate course joined it in 1955. The Department of Macromolecular Science was established in 1959. Three Departments of Physics were integrated into one Department of Physics in 1964 and the Department Earth and Space Science was established in 1995.

As emphasis was being put on Graduate Schools between 1995 and 1996, the new Graduate School of Science was established, composed of 6 Departments: Mathematics, Physics, Chemistry, Biology, Macromolecular Science, as well as Earth and Space Science, all of which still continue in the Graduate School of Science. Affiliated institutes of the Graduate School of Science, the Research Center for Structural Thermodynamics and the Project Research Center for Fundamental Sciences have been conducting educational research together with the Graduate School of Science.

Furthermore, the Center for Advanced High Magnetic Field Science was newly established on April 1st, 2014.
Characteristics of Graduate School of Science

Inheriting the spirit and tradition of the School of Science at Osaka University, the Graduate School of Science continues its research policies, which focus on a liberal, lively spirit and creativity unencumbered by old conventions. It is very important for the progress of science to have the opportunity to focus on basic studies, which are apparently thought of as an unimportant issue. For instance, nobody pointed out the importance of the structures of genes when they were revealed in 1955. However, with the progress of other fields of science, the structures of genes have been applied to many different technologies. There are so many examples similar to this case. That is, the progress of technologies is based on cultures created by scientific studies. When a specific country produces a unique, revolutionary technology, it should have a well-established, domestic-scientific culture.

Current scientific technologies are on their way to being highly advanced, specialized, and covering a wide range. However, the original missions of science studies have not changed, which include creating new cultures based on a tradition of basic science, as well as educating researchers in order to create new cultures. However, it is important to fully understand how societies and scientific technologies are related to such issues as energy and environmental problems. And it is also important to have an international, broad view, as well as an attitude of dedication to the betterment of human beings. From a universal point of view, people involved in research need to produce more creative, revolutionary results to contribute to the development as well as the happiness of humans. Under these circumstances, graduate education should not only educate students through studies focusing on normal, basic studies, but should also aim to educate specialists, who can provide answers to meet industrial needs. In order to achieve that, a graduate school has to play the following two important roles: one is education through studies in each individual field of study, and the other is synthetically balanced education which integrates and organizes various fields of study.

The Graduate School of Science has been working on studies, aiming to achieve the following two purposes: (1) The Graduate School of Science should inherit the academic tradition of the School of Science, focusing on a liberal, creative research-based policy, and should also educate researchers who are independent in their own fields of study and also have excellent abilities. (2) By providing instruction on scientific research, which is basic to all scientific skills and technologies, the Graduate School of Science should plan to
educate and develop students to be highly specialized professionals who have knowledge in a broad range of natural science disciplines. In order to achieve these two purposes, while employing a significant number of professors and instructors from outside of the university, the Graduate School of Science has aimed to make educational studies advanced, interdisciplinary and internationalized through new scientific studies. As cooperative lecturers and professors inside the university, a great number of instructors from the Research Institute for Microbial Disease, the Institute of Laser Engineering, the Institute for Protein Research, the Research Center for Nuclear Physics, the Low Temperature Center, the Radioisotope Research Center and the Genome Information Research Center have joined the Graduate School of Science to teach courses related to their fields of study. Moreover, as additional posts open for professionals from cooperative institutes outside the university, a great number of researchers have participated in research studies at the Graduate School of Science. These institutions include The Institute of Physical and Chemical Research (RIKEN); Keio University Graduate School of Science and Technology; National Institute of Advanced Industrial Science and Technology (AIST); National Institute of Information and Communications Technology (NICT); the Peptide Institute INC.; JT Biohistory Research Hall, Inc. As mentioned above, the Graduate School of Science has a great number of excellent instructors to provide a wide range of instruction by focusing attention on various areas from basic science to the development of applied science.

Science technology has made remarkable progress in the 20th century. This progress will obviously accelerate in this century. Scientific technology has enabled humans to achieve an enriched, comfortable life as well as increased longevity, both of which no previous generation has ever experienced. On the other hand, the continuous search for comfort has resulted in serious environmental problems such as the shortage of energy sources and the destruction of the earth's environment. These problems have surfaced within a fairly short period of time, relative to the long human history, since the ancestors of modern humans first appeared on earth ten thousands years ago. Humans in the twenty-first century are therefore required to use sagacity and intelligence to understand all the scientific technologies created during the course of human history. We cannot prevent the deterioration of the quality of human life on earth unless we can create revolutionary scientific technologies that can provide radical solutions to various problems related to energy, the environment, food supply, and overpopulation. Therefore, our generation has an obligation to pass on basic science to the next generation, which can produce the scientific technologies necessary for coping with the problems mentioned above.

In the Graduate School of Science, researchers eager to contribute to this mission have been making great efforts in educational studies, surrounded by liberal and active study environments, in order to achieve aims in accord with the overall mission of the School.
Organization of Graduate School of Science and School of Science

Graduate School of Science / School of Science

Department of Mathematics (Graduate Course / Undergraduate Course)
  Graduate School of Information Science and Technology
  Center for Education in Liberal Arts and Sciences
  Cybermedia Center
  Keio University Graduate School of Science and Technology

Department of Physics (Graduate Course / Undergraduate Course)
  Graduate School of Frontier Biosciences
  Institute of Scientific and Industrial Research
  Research Center for Nuclear Physics
  Radioisotope Research Center
  Center for Education in Liberal Arts and Sciences
  Low Temperature Center
  Institute of Laser Engineering
  Cybermedia Center
  Cooperation with the Institute of Physical and Chemical Research (RIKEN)

Department of Chemistry (Graduate Course / Undergraduate Course)
  Institute for Protein Research
  Institute of Scientific and Industrial Research
  Radioisotope Research Center
  Center for Scientific Instrument Renovation and Manufacturing Support
  Museum of Osaka University
  Center for Education in Liberal Arts and Sciences
  Cooperation with National Institute of Advanced Industrial Science and Technology, KANSAI
  Collaboration with Peptide Institute, Inc.

Department of Biological Sciences (Graduate Course / Undergraduate Course)
  Graduate School of Frontier Biosciences
  Institute of Scientific and Industrial Research
  Genome Information Research Center
  Cooperation with Biohistory Research Hall, Inc.
  Cooperation with Kansai Advanced Research Center, Advanced ICT Research Institute National Information and Communications Technology
  Cooperation with RIKEN Spring-8 Center (HARIMA)
  Cooperation with RIKEN Center for Developmental Biology (KOBE)

Department of Macromolecular Science (Graduate Course)
  Institute for Protein Research
  Department of Safety and Hygiene

Department of Earth and Space Science (Graduate Course)
  Institute of Laser Engineering

Project Research Center for Fundamental Sciences

Research Center for Structural Thermodynamics

Center for Advanced High Magnetic Field Science

Administrative Office

Special Affairs Staffs
General Affairs Section
Personnel Section
Undergraduate Students Section
Graduate Students Section
Accounting Section
Procurement Section
University-Industry Collaboration Section
Research Affairs Section
Office for International Students