PROSPECTUS
FOR
THE DOCTORAL PROGRAM

Graduate School of System Informatics
KOBE UNIVERSITY
3rd Term, 2021
(Starting in October, 2021)

There may be changes to the application guidelines due to the novel coronavirus (COVID-19) situation.
If there are any such changes, we will inform you through the website below.
Please check our website again before applying for the entrance examination.
http://www.office.kobe-u.ac.jp/eng-ofc/kym/csi/jyuken.html

About Kobe University Graduate School of System Informatics

Graduate School of System Informatics, Kobe University was established in April 2010 when the Department of Computer Science and Systems Engineering was separated from the Graduate School of Engineering. Both the Master's Program and Doctoral Program of the Graduate School of System Informatics are organized in the following three departments: Systems Science, Information Science, and Computational Science.
A Doctor of Philosophy in System Informatics, a Doctor of Philosophy in Engineering, or a Doctor of Philosophy will be granted upon completion of the Doctoral Program of the Graduate School of System Informatics. Also, by completing the "Computational Science Intensive Course" offered by the Department of Computational Science, the student will be granted a Doctor of Philosophy in Computational Science.

Admission Policy of the Graduate School of System Informatics, Kobe University

The Graduate School of System Informatics engages in research and education in the fields of systems science, information science, and computational science, focusing on system information (significant information that exists in a broad range of systems, including nature, engineering, and society) to create and expand new academic disciplines, in order to conceive new knowledge and values. The Graduate School hopes to train people possessing great creativity and a cosmopolitan outlook in order to contribute towards this objective. For this purpose, the Graduate School is committed to enrolling students from a wide range of backgrounds, not only from Japan but also from overseas.

Doctoral Program

●Applicants are sought with the following qualities and abilities:
The Doctoral Program of the Graduate School of System Informatics hopes to enroll students who meet one of the following criteria:
Students who have studied system technology, information technology, computational technology, or a similar technology at an engineering- or informatics-related faculty or graduate school.
[Required competences: knowledge of and technical ability in Engineering, interest, and motivation]
Students who demonstrate a strong interest and enthusiasm for applying and expanding the application of technology (such as system, information and computational technologies) to the various fields of science including, medicine, humanities, or social science.
[Required competences: critical thinking, good judgement, expression, initiative, cooperativeness, interest, and motivation]
Students who are rich in creativity and ideas, demonstrate logical thinking skills, and are strongly motivated toward creating and developing new fields in system informatics.
[Required competences: critical thinking, good judgement, expression, interest, and motivation]
In addition, the Doctoral Program of the Graduate School of System Informatics welcomes working adults, such as those who have conducted and published research at a company, laboratory, or the like.

●Basic Policy for the Selection of Students:
In order to select students demonstrating the qualities above, in line with the Diploma Policy and Curriculum Policy of the Doctoral Program of the Graduate School of System Informatics, the Graduate School assesses various competences in the entrance examination below.
General entrance examination is mainly designed to assess knowledge and technique or critical thinking, good judgement, expression, initiative, and cooperativeness, and interest and motivation.

(Admissions enquiries for the Doctoral Program of the Graduate School of System Informatics)

Student Affairs Section, Graduate School of Engineering, Kobe University
1-1, Rokkodai-cho, Nada-ku, Kobe 657-8501
Tel : 078-803-6350
e-mail: eng-kyomugakusei@office.kobe-u.ac.jp
Website of the Graduate School of System Informatics: http://www.csi.kobe-u.ac.jp/
Website of Kobe University: https://www.kobe-u.ac.jp/

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◎ Attached Forms (The Set of Required Application Forms)

○ Application Form (Form No.1)

○ Curriculum Vitae (Form No. 2)

○ ID for the examination (Form No.3)

○ Certificate of payment Card (Form No. 4)

○ About the payment of entrance exam fee for application (Form No. 5)

○ Summary of master's thesis and Research Progress Report (Form No. 6)

○ Research proposal (Form No. 7)

○ Self-addressed Forms (Form No. 8)

- ○ Envelope (For sending the ID for the examination) (Form No. 9)
- ○ Application Form for Examination of Qualification (Form No. 10)
- ○ History of research (Form No. 11)
- ○ Research experience (Form No. 12)

I The Doctoral Program of Graduate School of System Informatics General Admission Guidelines

Systems Science
Information Science
Computational Science

2021 October (3rd Term)
Graduate School of System Informatics, Kobe University, the Doctoral Program
Application Guidelines

1. Departments and the Number of Students to be Accepted

Department	No. of Students
Systems Science	A few
Information Science	A few
Computational Science	A few

(Note) The number of students to be accepted includes students who go on to a doctoral program from our master's programs, foreign students and students entering from the workforce.

2. Qualification for Applicants

Applicants must currently meet one of the following requirements or be eligible to meet one of these requirements by September 30, 2021.

(1) Those who have obtained a master's degree or a professional degree.
(2) Those who have obtained a degree equivalent to a master's degree or a professional degree in a foreign country.
(3) Those living in Japan who have completed a correspondence course in a foreign-affiliated educational institution and obtained a degree equivalent to a master's degree.
(4) Those who have completed their education in a foreign-affiliated university within a school educational system of a foreign country in Japan and designated by the Minister of Education, Culture, Sports, Science and Technology, limited to those who have obtained a degree equivalent to a master's degree or a professional degree.
(5) Those who have been conferred a degree equivalent to a master's degree from the United Nations University which was promulgated by the General Assembly of the United Nations on December 11, 1972 and in accordance with the Agreement between Japan and the United Nations concerning the Act on Special Measures Incident to Enforcement of the Agreement between the United Nations and Japan regarding the Headquarters of the United Nations University (1976, Resolution 72, Article 1, Item2)
(6) Those who have completed the curricula at a foreign university, an educational institution which is designated under Item 4, or the United Nations University and are recognized as having academic abilities equivalent or superior to those given a master's degree by passing the examination and screening which are equivalent to the ones stipulated in Article 16, paragraph (2) of the Standards for Establishment of Graduate Schools (under Ministry of Education, Culture, Sports, Science and Technology Ordinance No. 28, 1974).
(7) Those who are approved by the Minister of Education, Culture, Sports, Science and Technology (under Minister of Education, Culture, Sports, Science and Technology Public Notice No. 118, 1989).
(8) Those who are 24 years of age or older and are recognized by Eligibility Screening as having academic abilities equivalent or superior to those given a master's degree or a professional degree.

【Note】 Those who intend to apply under the requirement (7) or (8) above should refer to "8. Eligibility Screening" because they are subject to screening prior to their applications

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3. Application Procedures

（1） Period of application and how to submit the application

From July 20 (Tue) 2021 to July 27 (Tue) 2021 (except Saturday & Sunday)

When you submit in person, the office hour is Monday through Friday, from 9:00 to 12:00 & 13:00-17:00.

If you submit by mail, your application documents must arrive no later than 17:00, **July 27 (Tue) 2021.** On the envelope, write “Application Documents for the Doctoral Program” in red and mail it by “express registered mail”.

（2） Mailing Address:

Kobe University Graduate School of Engineering, Students Affairs Section
1-1, Rokkodai-cho, Nada-ku, Kobe 657-8501
Tel (078) 803-6350 (direct)

（3） Application documents

（A） Application form: Form designated by the Graduate School of System Informatics (Form No.1)

（B） ID for the examination (Form No. 3) and Certificate of payment Card (Form No. 4)

（C） Photograph: Affix two copies of photograph to the designated places on the application form and the ID for the examination. Enclose also a copy of photograph which is 3 cm long and 2.4 cm wide for your student ID card.

The photograph should be 4 cm long and 3 cm wide and of upper body, taken within three months prior to submitting the application; in the picture, you should be looking straight ahead with your head uncovered.

（D） Curriculum Vitae: Form designated by the Graduate School of System Informatics (Form No.2)

（E） Certificate of (Prospective) Graduation of a master’s degree program of graduate school (master’s course). If the Graduation Certificate indicated above does not show the degree you obtained, please submit a certificate of degree as well.

（F） Academic transcript （1）: Academic performance record created by the head of faculty or the principal of the university you graduated from

（G） Academic transcript （2）: Academic performance record created by the head of department or the principal of the graduate school you graduated from

（H） Entrance exam fee: 30,000 Japanese yen

Bring the attached form of JP bank (Form No. 5) and deposit the fee from the bank; make sure to affix the proof of receipt of postal transfer for entrance exam fee to the mounting card and send it together with the application documents. (When paying from overseas, please refer to the “Guide for overseas remittance of entrance examination fees” on page 9.) Japanese government-sponsored international students who will continue to be so after enrollment do not have to pay the fee on condition that they submit the “Certificate of Japanese Government-sponsored International Student” from the university you are currently enrolled (unless you are a student of Kobe University).

（I） Master’s thesis:

（a） Applicants who have completed a master’s degree program (master’s course)

ⅰ） A copy of your master’s thesis written either in Japanese or in English. If not available, please contact the Student Affairs Section of Graduate School of Engineering in advance and follow the instructions you will be provided.

ⅱ） Summary of master’s thesis (A4): A set of copies of the outline written in both Japanese (approx. 2,000 characters) and English (approx. 1,200 words), with a cover sheet designated by the Graduate School of System Informatics (Form No. 6). For foreign applicants, an English copy alone is sufficient.

(b) Applicants who are expected to complete a master's degree program (master's course) or succeeded in eligibility screening

Research Progress Report (A4): A set of copies of the report written in both Japanese (approx. 2,000 characters) and English (approx. 1,200 words), with a cover sheet designated by the Graduate School of System Informatics (Form No. 6). For foreign applicants, an English copy alone is sufficient.

＊ Any reference material may be submitted along with either (a) or (b).

(J) Research proposal:

(All applicants except successful applicants of eligibility screening)

A copy of A4 report written in Japanese (approx. 2,000 characters) or English (approx. 1,200 words) with a cover sheet designated by the Graduate School of System Informatics (Form No. 7) indicating the details of your intended research and field.

(K) Resident Certificate: Foreign applicants should submit a Copy of Resident Certificate which is issued by the local municipality (valid for 30 days from issue date), or a document that can take the place of the Resident Certificate. (Only for those residing in Japan)

(L) Self-addressed Forms: Write your postal code, address, and name in the form designated by the Graduate School of System Informatics (Form No.8).

(M) Envelope:

(All applicants except those who live abroad)

Write your postal code, home address and name on the envelope designated by the Graduate School of Engineering and attach 384 yen stamps (Form No.9).

〔Note〕

(1) No changes are allowed in the application documents once they have been received. The entrance exam fee will not be returned to an applicant except in cases where the applicant did not apply or the application was not accepted.

(2) Make sure that documents created in a foreign language other than English are accompanied by a Japanese translation with the translation accreditation issued by a public institution such as the diplomatic facilities of Japanese or foreign governments.

(3) Applicants should select a desired faculty member from the "Education and Research Fields, Research Subjects, and Faculty Members" and indicate his/her name in the admission application form. Without the desired faculty member's name, the application documents will not be accepted. Also, **applicants should closely contact the expected academic supervisor and create a research proposal.**

(4) For those who submit a certificate of prospective graduation, please submit a certificate of graduation when you enroll. If the certificate does not show the degree you obtain, please submit a certificate of degree as well.

4. Screening Methods

Admission will be determined based on the results of academic examination together with the submitted documents.

The academic examination will consist of an oral examination and interview.

(1) Content of a master's thesis or research progress report

Examined as to whether or not the applicant has basic academic skills required for the course.

(2) English capability (for applicants graduated from a foreign university, both English and Japanese language skills are examined)

Examined as to whether or not the applicant has language skills required for the course.

(3) Content of research proposal

Examined as to whether or not the research plan meets the doctoral degree to be awarded.

5. Date and Place for the Interviews

Date	Place	Remark
August 26, 2021 (Thu)	Graduate School of System Informatics Building, Kobe University	Applicants will be notified of time and place for the interview at a later date.

【Access to Kobe University Graduate School of System Informatics Building】
Hanshin “Mikage” station, JR “Rokkomichi” station, or Hankyu “Rokko” station.
Kobe Municipal Bus No. 16 (bound for Rokko Cable)
Shindai Kokusai Bunka Gakubu Mae, 5 min on foot to the Rokkodai Campus

For those who have difficulty in meeting at the indicated date and place above for special reasons, a remote interview might be permitted and provided through the internet. Applicants wishing to be interviewed remotely must apply to the expected academic supervisor and receive a written permit before submitting the application form.

6. Announcement of Successful Applicants

September 9, 2021 (Thursday)10:00 (scheduled)
The results will be announced via the website of the Graduate School of System Informatics, Kobe University.
http://www.office.kobe-u.ac.jp/eng-ofc/kym/csi/jyuken.html
※Successful applicants will receive the acceptance letter. Inquiries will not be accepted via telephone.

7. Admission Procedure

(1) Admission procedure period and admission documents
The admission procedure period is scheduled to be around late September 2021. The details will be mailed to each successful applicant in early September 2021 with necessary documents for the procedure.

(2) Fees

Division		In Japanese yen	Remark
Admission fee		282,000	Admission fee should be paid during the admission procedure period.
Tuition fee	For semester	267,900	Refer to the “General Information for Successful Applicants” which will be sent in late September 2021. ［In case the tuition is revised, the new fee is applied from the time of the revision.］
	Annual total	535,800	

〔Note〕
(1) The admission of applicants who fall under the following items may be revoked.
(A) Applicants who made a false declaration
(B) Applicants who did not meet the qualification requirements
(2) The admission fee already paid will not be returned for any reason.
(3) Admission fee and tuition fee are not required for Japanese government-sponsored international students who will continue to be so after enrollment.

8. Eligibility Screening

Those who intend to apply under the requirements "2. Eligibility Screening (7) or (8)" will be screened by the following documents submitted.

(1) Documents necessary for screening

(A) Application Form for Examination of Qualification: the application form designated by the Graduate School of System Informatics (Form No. 10)

(B) Graduation certificate created by the head of faculty or the principal of the university you graduated from.

(C) Curriculum Vitae: the form designated by the Graduate School of System Informatics (Form No. 2).

(D) History of research: created by immediate manager or representative of education/research institute or company where the research was conducted. If such a certification is unavailable, an application written by the applicant can substitute it. Use the form designated by the Graduate School of System Informatics (Form No. 11).

(E) Research experience (A4): the outline of a thesis that is "an equivalent of master's thesis". A set of copies written in both Japanese (approx. 2,000 characters) and English (approx. 1,200 words), with a cover sheet designated by the Graduate School of System Informatics (Form No. 12). For foreign applicants, an English copy alone is sufficient.

(F) Materials of research achievements: Index of thesis and separate print (photocopy acceptable), which are the basis of the research achievements, along with references of other achievements, if any. In case of collaborative research, attach the material clearly indicating the portion the applicant was in charge.

(G) Research proposal (A4): a copy of a report indicating the field and research the applicant would like to explore, written either in Japanese (approx. 2,000 characters) or English (approx. 1,200 words) with a cover sheet designated by the Graduate School of System Informatics (Form No. 7).

(H) A self-addressed envelope (23.5cm long×12cm wide with a 384 yen stamp)

Note that those who have completed a 6-year course of medical college, dental college, or veterinary medicine are not required to submit the abovementioned (D), (E) and (F).

(2) Period and place for submission

Your application documents must be submitted in person or mailed (simple registered mail marked "Application Form for Examination of Qualification for the Doctoral Program of Graduate School of System Informatics" in red on the envelope) by Monday, June 21, 2021, to the Student Affairs Section of the Graduate School of Engineering, Kobe University.

Office hours (for those who hand in): Monday through Friday: 9:00-12:00 & 13:00-16:00

(3) Announcement of the screening results

Successful applicants will be notified of the result by Tuesday, July 6, 2021.

9. Others

1. Admission Fee Payment Exemption

Applicants recognized as having extreme difficulties in making the payment of the admission fee who fall under any of the following categories and make the relevant application may be exempted from the payment of all or half the admission fee upon screening (low income does not automatically qualify applicants for the exemption).

（1）The person mainly responsible for paying school expenses for the applicant having passed away within the year prior to admission.

（2）The applicant or the person mainly responsible for paying school expenses for the applicant having suffered from flood or storm damage within the year prior to admission.

（3） The applicant having a reason equivalent to either of the above-mentioned that is recognized by the University.

2. Admission Fee Payment Deferral

Applicants who fall under any of the following categories and make the relevant application may be able to defer payment of the admission fee for a certain period upon screening (subject to confirmation by Kobe University).

（1）Applicants, for whom payment by the payment deadline has become difficult due to financial reasons, and who are recognized as having excellent academic records.

（2）Applicants for whom payment by the payment deadline has become difficult because the person mainly responsible for paying school expenses for the applicant has passed away within the year prior to admission.

（3）Applicants for whom payment by the payment deadline has become difficult because the applicant or the person mainly responsible for paying school expenses for the applicant has suffered from flood or storm damage within the year prior to admission.

（4）Applicants for whom payment by the payment deadline has become difficult due to unavoidable circumstances other than indicated above.

3. Tuition Fee Payment Exemption

Applicants who fall under any of the following items and make the relevant application may be exempted from the payment of all or half of the tuition fee upon screening.

（1）Applicants recognized as having difficulty in making the payment due to financial reasons and having excellent academic records.

（2）Applicants, except those who fall under (1), recognized as having extreme difficulty making the payment due to any of the following circumstances.

i The person mainly responsible for paying school expenses for the applicant having passed away within a year prior to admission (when concerning the exemption of tuition fee of the term of the admission).

ii The applicant or the person mainly responsible for paying school expenses for the applicant having suffered from flood or storm damage within a year prior to admission (when concerning the exemption of tuition fee of the term of the admission).

iii The applicant having a reason equivalent to either of the above-mentioned that is recognized by the University.

4. Handling of personal information

(1) Kobe University complies with the legislation such as “Act on the Protection of Personal Information Held by Independent Administrative Legal Entity” in using the personal information on applicants, and handles it based on the “Guideline on the Control of Personal Information Held by Kobe University”.

(2) Personal information including the individual results of screening shall be used for screening (application procedures, conducting screening), announcement of successful applicants, enrollment procedures, and materials for reviewing the screening methods for the future.

(3) Personal information of enrolled students provided for the application will be used for supporting the students after enrollment (health management, tuition fee exemption or scholarship application, etc), educational purposes such as academic instruction, tuition-fee related affairs, and other corresponding work.

(4) Part of the operations may be outsourced to an agency. (Hereafter called “Agency”). In the case of outsourcing the operations, all or part of the personal information provided will be provided to such an Agency with nondisclosure obligation within a certain limit

necessary for the Agency to execute the operations.

5. Control and Prevention of Infectious Diseases

Submission of a certificate demonstrating inoculation and an antibody test against measles and rubella:

Kobe University has implemented the *Measles and Rubella Registration Policy*, and all newly enrolled Kobe University students must submit one of the following three certificates (①, ②, or ③) to prevent a possible outbreak of measles and rubella on campus.

Please note that students admitted into the following schools should submit either ① or ③: School of Medicine (Faculty of Medicine and Faculty of Health Sciences),the Graduate School of Medicine, or the Graduate School of Health Sciences.

① A vaccination certificate to prove that you were inoculated against measles and rubella (twice each after one year of age) .

② A vaccination certificate to prove that you were inoculated with measles and rubella vaccines each within the last five years (since April 2017).

③ An antibody certificate verifying that you have sufficient antibody titer in your blood (refer to the chart next page) to prevent the development of measles and rubella, based on the results of an antibody test performed within the last five years (since April 2017).

＊ For ① and ②, it can be a combined vaccine of measles and rubella vaccines (e.g., MR vaccine).

＊ For ① and ②, the certificate must be issued by an accredited medical institution,and state the type of vaccine and the date of inoculation.

＊ For ③, the certificate must specify the measuring method and the measured values of antibody titer in your blood (refer to the next page), and it must satisfy the judging standard listed in the chart. A blood test report sheet itself can be accepted for submission.

If the antibody titer in your blood is insufficient, you must receive the necessary vaccination, and submit either ① or ②.

＊ You may submit a combination of ①, ②, and ③ (e.g., ① for measles, and ③ for rubella).

＊ If the antibody titer level is below requirements, yet you cannot be inoculated with vaccines for some reason (e.g. illness or body composition), please submit an official document (for example, a certificate issued by the doctor) explaining why.

<Submission Period and Place of Submission>

・All successful undergraduate and graduate applicants enrolling in April.

Submit the certificate when you register at the Medical Center for Student Health (Rokkodai) during your routine medical check-up scheduled for early April.

・Successful applicants enrolling in October:

Submit the certificate when you register at the Medical Center for Student Health (Rokkodai) during the routine medical check-up scheduled for mid-late October.

Measuring Methods and Judging Standards for Protective Antibodies in Blood

	Measuring Method	Judging Standard	Remarks
Measles	IgG－EIA method PA method NT method	8.0 ≦ positive 256x ≦ positive 4.0x ≦ positive	Positive result by one of these three methods
Rubella	HI method IgG－EIA method	32x ≦ positive 8.0 ≦ positive	Positive result by one of these two methods. (HI method is recommended)

Make sure the above methods are followed when the antibody titer is measured in your blood. The protective antibody value differs according to the measuring method used. Please note that **the judging standards are higher than the usual standards used at medical institutions.**

Before you visit a medical institution, please make an appointment and confirm that the antibody test and/or the vaccine you need are available at that institution.

When you visit a doctor at a medical institution, make sure you present this guidebook so your doctor can issue the necessary certificate(s). (Please make sure you confirm with your doctor the measuring methods and judging standards when measuring the antibody titer in your blood.)

＊ Points to Consider when Submitting a Certificate:

① Please submit the original certificate and one set of copies (A4 size).

② If the certificate is written in a language other than Japanese or English, please attach a document that shows either a Japanese or English translation.

For further information, please refer to:

Medical Center for Student Health, Kobe University Tel: 078-803-5245

Student Support Division, Student Affairs Department, Kobe University Tel: 078-803-5219

＊ If you have any questions concerning the application, please contact us below.

Students Affairs Section,
Graduate School of Engineering,
Kobe University,
1-1 Rokkodai-cho, Nada-ku, Kobe 657-8501
TEL (078) 803-6350
e-mail: eng-kyomugakusei@office.kobe-u.ac.jp

"Guide for overseas remittance of entrance examination fees for the 2021 Doctoral Programs at the Graduate School of System Informatics, Kobe University"

The entrance examination fee is 30,000 Japanese yen. When paying from overseas, please be sure to make the payment in Japanese yen and remit 30,000 yen as the examination fee to the designated bank account mentioned below.
The remittance fees will be borne by the applicant, while Kobe University covers any other commissions including lifting charges or handling fees. No overseas remittance checks will be accepted.
A photocopy of the remittance request form must be attached to your application for admission.

Bank name	Sumitomo Mitsui Banking Corporation
Bank code	0009
Swift Code	SMBCJPJT
Branch	Rokko
Branch Code	421
Account No.	4142727
Recipient	Kobe University

In addition, please include the following information, if necessary.
Purpose of Remittance: Entrance Examination Fee
Message to Payee, if any: Please indicate "D63 : Applicant's full name"
＊ Please put "D63" before your name.

◎Special Education System for Students Entering From Workplace

Recently, increasing numbers of engineers and researchers in the workforce wish to continue education and training as well as obtaining doctoral degrees in graduate school. However, education programs of graduate schools usually require them to spend time away from their workplace to focus on the graduate program for three years, which is likely to limit their learning opportunities. On the other hand, the "Graduate School Foundation Standard, Article 14" stipulates that "When special educational measures are recognized as necessary in the programs of the Graduate School, appropriate educational measures can be taken such as providing classes or research guidance during night or certain periods." considering the students from the workplace. Based on these backgrounds, the Doctoral Program of the Graduate School of System Informatics has implemented special educational measures as stipulated by the statement.

The following items summarize the program.

1. Part of class by a faculty member upon an agreement of the member, and part of research guidance by academic supervisor upon an agreement of the supervisor, can be provided during night or a certain period.
2. If the academic supervisor recognizes that the thesis is making good progress, and that superior facilities or equipment for the research are provided in the relevant company where outstanding performance can be expected, the student can conduct research within the company.

II Overview of the Doctoral Program of the Graduate School of System Informatics

1. Philosophy and Features of Curriculum

Our Doctoral Program promotes education and research for fostering researchers, higher education and research facility faculty members, and skilled professionals with advanced independent research skills, high creativity, and an international mindset for identifying, exploring and resolving problems. To this end, the program establishes rigorous courses related to the student's doctoral thesis, providing guidance in relation to investigational research, identifying problems, research planning, research implementation, research results organization, and methods for solving unresolved issues. The program also introduces a system of professional courses taught by multiple faculty members as well as cross-graduate-school courses, thereby fostering human resources equipped with advanced expertise and a broad perspective.
In an effort to aid our students in establishing careers as researchers specializing in computation science, we have established a "Computational Science Intensive Course" which provides the students with a cohesive education from the Masters Program through the Doctoral Program.
Unlike a general course where the student completes the masters program and then enters the doctoral program, our intensive course is designed with the objective of the students obtaining a doctoral degree from the start. Based on a curriculum that integrates various fields of education through collaboration with universities nationwide and short-term, intensive seminars, the course fosters human resources equipped with practical ability related to high-speed computation as well as highly professional knowledge and skills related to the fields of computational science.
The following explains the features of the curriculum we offer at the Doctor's Degree Program of the Graduate School of System Informatics.

2. Features of Doctoral Program Education

Students from Workforce (Complying with the Graduate School Establishment Standard Article 14: Special Case)
We are willing to accept students from the workforce in the Doctoral Program with an aim to fostering engineers equipped with a variety of highly advanced professional skills in System Informatics. To help such students learn while at work, we provide a system complying with the "Special Case of Education Based on School Establishment Standard, Article 14".

Establishment of Computational Science Intensive Course
In the Department of Computational Science of the Graduate School of System Informatics, we have established the "Computational Science Intensive Course" in the doctoral course, which is a cohesive education program covering a Master's Program and Doctoral Program. The curriculum in the Computational Science Intensive Course consists of subjects that enable students to obtain advanced knowledge and capability covering a wide range of expertise concerning high-speed computation and other computational science fields. To enhance the curriculum, we offer course subjects in collaboration with other departments and universities as follows.

Collaboration with Universities Nationwide
Computational Science involves extremely interdisciplinary education and research disciplines, which include various sciences and technologies such as the next-generation super computing technology as its basis. To provide systematic and specialized education covering broad subjects involving the computational science fields, it is essential to establish an educational system where the leading researchers in relevant fields belonging to other departments of Kobe University or other universities in Japan can provide the disciplines. To realize this, we have jointly established an education system nationwide in collaboration with other universities, which enables us to provide a curriculum that integrates a variety of educational fields, and foster human resources specialized in computational science.

Short-term Intensive Seminars
As a part of the official curriculum, we provide short-term intensive seminars for practical education which focuses on practical learning utilizing the super-computer. This aims to strengthen the practical capabilities in computational science such as advanced parallel programming technology, large-scale simulation technology, and visualization of computational results technology.

Measures Taken for New Students Enrolled from the Doctoral Program
We provide course guidance at the time of enrollment to explain the basic philosophy of the curriculum, and the organization of the courses, so students can fully be aware of the requirements necessary for course completion. In

particular, students who do not have a Master's Degree in System Informatics are instructed to enroll in some courses in the Masters Program if considered necessary, depending on the kind of master's degree and the background of the student. As the courses of the doctoral program are closely related to the research subjects given in each education and research field, students are advised to mainly enroll in advanced studies offered by multiple faculty members in the student's affiliated course. Students in the Computation Science Intensive Course in the Computational Science Department are encouraged to enroll in the advanced courses offered by the collaborative course, depending on their chosen research subject.

Doctoral Degree Accreditation Process
Research progress presentations are conducted for research concept, research progress, and future research plan during both the 1st year and 2nd year to instruct the students to create an appropriate doctor's thesis. In the 3rd year, the research result presentation is conducted, and if the research results are acknowledged as superior, the student can proceed to submitting the doctoral thesis and reviewing (including the doctoral thesis presentation). All departments make a concerted effort in conducting research progress presentations, research results presentations, and the doctoral thesis presentation so that each department, or the Graduate School of System Informatics when necessary, can be involved in guiding the students' research. For those who finish early, the research result presentation and the doctoral thesis presentation are conducted during the 1st or the 2nd year.

3. Departments and Divisions of the Graduate School of System Informatics

The Graduate School of System Informatics consists of three departments: Systems Science, Information Science, and Computational Science.

(1) Systems Science
The Department of Systems Science provides the student with the interdisciplinary education and research on theories and technologies required for system analysis, design, configuration and operation. Thus, in the Masters Program, the department provides the student with the theory of systems approach methodology and problem-solving skills for effectively practicing analysis and synthesis. The department aims to foster human resources with high creativity and an interdisciplinary perspective. In the Doctoral Program, the student will deepen their knowledge about specialized fields; in this program, we aim to foster researchers with advanced skills capable of creating new theories and technologies to integrate different fields.
To this end, the Department of Systems Science consists of the following three divisions as its pillars: Fundamentals of Systems Science, Innovations of Systems Science, and Applied Robot Science.

Fundamentals of Systems Science
The Division of Fundamentals of Systems Science provides the student with an education and research experience in the theoretical basics and methodologies for system analysis, design, construction, and operation. The division includes four research groups: Systems Planning, Optimum System Design, Applied Optics, and Systems Control.

Innovation of Systems Science
The Division of Innovation of Systems Science provides the student with an education and research experience in methodologies and techniques related to the realization of systems having near human intelligence, and system theories for intelligent system design. The division has three research groups: Mathematical System Analysis, System Analysis, and Intelligent Systems.

Applied Systems Science
The Division of Applied Systems Science provides the student with an education and research experience in system application methodologies and techniques, with a focus on the applicable aspects of system science and engineering theories and methodologies. This division targets the construction theories of sensor information systems for recognizing system environments, theories of recognition and understanding of a three- dimensional world, rational planning and control theories for systems, and theories of system application methodology and techniques for FA systems and industrial robots.

(2) Information Science
The Department of Information Science provides the student with education and research on establishing mathematical information infrastructure theories, exploring new methodologies for information processing, and developing cutting-edge information application techniques. Thus, in the Masters Program, we aim to foster

human resources with a broad perspective and the capability of taking leadership roles in wide scopes of discipline—from basic theories in relation to information science that contributes to developing, processing, and utilizing valuable information, to the social application thereof. In the Doctoral Program, we aim to foster researchers equipped with advanced problem-identifying, exploring, and solving capabilities as well as high creativity in these academic fields.
To this end, the Department of Information Science consists of the following four divisions as its educational pillars: Foundation of Information Sciences, Intelligent Informatics, Kansei and Media Art, and Integrated Intelligence.

Foundation of Information Sciences
The Division of Foundation of Information Sciences provides the student with an education and research experience in mathematical information infrastructure theories, and elementary technologies for information processing. The division has four research groups: Mathematical Logic and Statistics, Processor Architecture, Software Science and Telecommunications.

Intelligent Informatics
The Division of Intelligent Informatics provides the student with an education and research experience in methodologies and algorithms for information expression, acquisition, processing, and applications thereof. The division provides the following four research groups: Integrated Information Systems, Knowledge and Information Processing, Media Informatics, and Emergent Computing.

Kansei and Media Art
Research and development of Kansei and media art systems focuses on display and actuation technologies that allow precise information transmission through multiple I/O methods upon understanding the circumstances. Our lecture mainly covers advanced technologies on human robot interaction, voice interaction, and haptic interaction.

Integrated Intelligence
The division of integrated intelligence provides the student with broad state-of-the-art education and research experience in machine learning and other basic techniques of artificial intelligence. Topics range from widely applicable and basic theoretical research to innovative applications focused on solving important specific problems of society.

(3)Computational Science
The Department of Computational Science provides the student with an education and research experience in technical foundation of high-speed computation and understanding and solving the natural events based on a computational approach and the application thereof. Thus, in the Masters Program, we aim to foster human resources equipped with broader knowledge and high creativity in the fields of massively parallel computation and algorithm, and the application thereof. In the Doctoral Program, we aim to foster researchers who excel in capability of creating new theories and techniques related to high-speed computation; and exploring, developing, and practicing innovative science and technology taking advantage thereof.
To this end, the Department of Computational Science consists of the following five divisions as its educational pillars: Fundamentals of Computational Science, Innovation of Computational Science, Applied Computational Science and Large Scale Computational science.

Fundamentals of Computational Science
The Division of Fundamentals of Computational Science provides the student with an education and research experience in mathematical methodologies and massively parallel information processing, which serve as the fundamentals of computational science. The division includes the following four research groups: Basics of Computational Science, Computational Intelligence, Computational Fluid Dynamics and Simulation Techniques.

Innovation of Computational Science
The Division of Innovation of Computational Science provides the student with an education and research experience in computational science and computational engineering, which serve as new scientific methodologies in the science and engineering field.
The division includes the following four research groups: Computational Molecular Engineering , Computational Biology, Computational Robotics, and Computational Space Science and Engineering

Applied Computational Science
The Division of Applied Computational Science provides the student with an education and research experience based on large-scale, practical subjects such as the physical process of climatologic and meteorological fluid system simulation and algorithms, predictions and actual results based on the incorporation thereof, and discrete system simulation for the substances that form the Earth’s crust.

Large Scale Computational Science
The large scale computational science research group educates concerning various advanced computational research fields from the system software for computer science to complex phenomena unified solution research. This division aims to teach large scale computational science using super-computers like the Fugaku at the RIKEN Center for Computational Science.

4. Education and Research Fields, Research Subjects, and Faculty Members

(1) Department of Systems Science

As of May 1, 2021

Divisions	Number	Education/Reserch Fields	Research Topics	Staff
Fundamentals of Systems Science	S-1	Systems Planning	Operational Research, Production Systems Engineering, Social Systems Engineering, Optimisation, Multi-Agent System, Management Engineering, Decision Support Theory, Service Engineering, System Simulation, Medical Engineering	Kaihara Toshiya Fujii Nobutada
	S-2	Applied Optics	Instrumentation Optics, Information Photonics, Computational Optics, Physical Optics, Image Processing, Optical Tomography, Optical Data Storage, 3D Display System, Optical Supercomputing, Quantum Information Science	Matoba Osamu Nitta Kouichi
	S-3	Systems Control	Environment Adaptive Robotics, Cognitive Motion, Human Interface, Bio-mimetic System, Care Support Engineering, Computational Robotics, Computational Linguistics	Luo Zhi-Wei Quan Changqin
Innovation of Systems Science	S-4	Mathematical System Analysis	Distributed Parameter Control Systems Theory, Infinite Dimensional Dynamical Systems, Operator Theory, Nonlinear PDEs, Mathematical and Theoretical Biology, Robust Control Theory, Nonlinear Systems Theory, Large Scale and Hybrid Systems Theory, Control System Design via Numerical Optimization, Time Delay Systems	Sano Hideki Masubuchi Izumi Kuniya Toshikazu Wakaiki Masashi
	S-5	System Analysis	Intelligent Robotics, Sensor Fusion, Robot-Human Interaction, Tele-Operation System, Soft Computing, Measurement engineering, Biological information measurement, Nondestructive testing	Kobayashi Futoshi Nakamoto Hiroyuki
	S-6	Intelligent Systems	Intelligent Decision Making, Virtual Reality, Mixed Reality, Medical Engineering, Computer Aided Diagnosis and Treatment	Hatono Itsuo Yin Chengjiu
Applied Robot Science (Collaborative Program) *	S-7	Applied Robot Science	Manufacturing System, Instrument and Control System, Motion Planning System, Robot Control System, Human Interface System	Yoshikawa Shoji

*) For the education and research fields of the collaborative program, the research may be conducted at somewhere other than Kobe University. If you would like to enroll in a collaborative program, contact us beforehand for the details. (Contact: Kobe University Graduate School of Engineering, Students Affairs Office)

(2) Department of Information Science

As of May 1, 2021

Divisions	Number	Education/Reserch Fields	Research Topics	Staff
Foundation of Information Sciences	I-1	Mathematical Logic and Statistics	Mathematical Logic, Mathematical Statistics, Foundations of Mathematics, Foundations of Informatics, Axiomatic Set Theory, Model Theory, Proof Theory, Computability Theory, Algebraic Combinatorics, Discrete and Computational Geometry	Kikyo Hirotaka Brendle Joerg Kikuchi Makoto Sakai Hiroshi Sawa Masanori Kurahashi Taishi
	I-2	Processor Architecture	Electron Devices, VLSI, Sensing Systems, Wearable Sensors, Signal Processing, Biomedical Signal Processing, Biomedical Engineering, Deep Learning	Kawaguchi Hiroshi † Izumi Shintaro
	I-3	Software Science	Logic Programming, Constraint Programming, Declarative Programming, Programming Language Processing Systems, Theorem Provers, Combinatorial Optimization, SAT	■ Tamura Naoyuki Soh Takehide
	I-4	Telecommunications	Information and Communication Engineering, Protocol Design, Perfomance Evaluation,Parallel and Distributed Processing, System Software	Ohta Chikara † Kamada Tomio
Intelligent Informatics	I-5	Integrated Information Systems	Integrated Circuit Design,Electromagnetic Compatibility, Advanced Packaging, Ubiquitous Hardware Systems, Hardware Security	Nagata Makoto †
	I-6	Knowledge and Information Processing	Smart Agriculture, Bioinformatics, Small Data, Data Mining, Machine Learning, Time Series Data Analysis, Network Analysis, Image Processing	Ohkawa Takenao
	I-7	Media Informatics	Speech/Image/Movie Recognition, Media Integration, Semantic Understanding, Dialogue/Conversation Processing, Intelligent Communication, Universal Communication, Disaster Information Processing, Pattern Recognition	Takiguchi Tetsuya
	I-8	Emergent Computing	Emergent System, Autonomous Decentralized System, Mathematical Programming Model, Agent Model, Adaptation/Learning Algorithm, Scheduling, Interaction, Nonholonomic System, Mobile Robot, UAV, Manipulator Dynamics	Tamaki Hisashi Urakubo Takateru
Kansei and Media Art (Collaborative Program) *	I-9	Kansei and Media Art	Human-Robot Interaction Technology, Voice Interaction Technology, Haptic Interaction Technology, Communication Media, Partner Media, Media Presentation Technique, Multilingual Speech Translation, Situation Recognition Technology, Network Robotics	Shiomi Masahiro Ishii Carlos□oshinori Minato Takashi
Integrated Intelligence (Collaborative Program) *	I-10	Integrated Intelligence	Machine learning, Artificial intelligence, Statistical modeling, Pattern recognition, Bayesian statistics, Intelligent information processing, Bigdata analysis, Optimization	Ueda Naonori Kawahara Yoshinobu

*) For the education and research fields of the collaborative program, the research may be conducted at somewhere other than Kobe University. If you would like to enroll in a collaborative program, contact us beforehand for the details. (Contact: Kobe University Graduate School of Engineering, Students Affairs Office)

Those marked "†" belong to Graduate School of Science, Technology and Innovation. Thus you cannot choose them as your academic supervisor. They will guide in collaboration with staffs of the corresponding Education/Research field in the department.

■ The faculty member is scheduled to retire in March, 2022.

(3) Department of Computational Science

As of May 1, 2021

Divisions	Number	Education/Reserch Fields	Research Topics	Staff
Fundamentals of Computational Science	C-1	Basics of Computational Science	Numerical Analysis, Finite Difference Method, Finite Element Method, Parallel Algorithms, Large Scale Simulation, Program Tuning Tools, Discrete Mechanics, Differential Geometry, Global Analysis, Mathematical Engineering	Yokokawa Mitsuo Yaguchi Takaharu
	C-2	Computational Intelligence	Artificial Intelligence, Machine Learning, Multimedia Processing, Data Mining, Text Mining, Information Retrieval, Software Engineering, Service/Cloud Computing, Ubiquitous Computing	Nakamura Masaki
	C-3	Computational Fluid Dynamics	Computational Fluid Dynamics, Finte Volume Method, Finte Element Method, Massively Parallel Simulation, Coupled and Unified Simulation, Compressible Flow, Heat Transfer, Complex and Complicated Turbulence, Combustion Flow, Grid Generation, Moving Boundary Method, Applied Aerodynamics, Aeroacoustics, Industrial Applications, Vehicle Aerodynamics,	Tsubokura Makoto Li ChungGang
	C-4	Simulation Techniques	Yin-Yang Grid and Its Applications, Large Scale Simulations, Computational MHD and its Visualizatons, Geodynamo, Big Data Visualization, Multivariate Data Visualization, Visual Data Analytics	Kageyama Akira Sakamoto Naohisa
Innovation of Computational Science	C-5	Computational Molecular Engineering	Massively Parallel Computing Algorithms, Explicitly Correlated Electronic Structure Theory, Strongly Correlated Electronic States, Scalable Molecular Orbital Theory, Model Space Quantum Monte Carlo, QM/MM Methods, New Energy	Ten-no Seiichiro † Tsuchimochi Takashi
	C-6	Computational Biology	Biomolecular System, Ab Initio Simulation, Multiscale Simulation, Large-Scale Parallel Computation, Medical and Pharmaceutical Applications, Molecular Dynamics Method, Molecular Orbital Method, Monte Carlo Method	Tanaka Shigenori Mori Yoshiharu
	C-7	Computational Space Science and Engineering	Numerical Simulations on the Lunar and Planetary Environments, Satellite-Plasma Interaction, Numerical Simulations on Ion Beam Appplication, Development of Plasma Particle Simulation Method	Usui Hideyuki Miyake Yohei
Applied Computational Science (Collaborative Program) *	C-8	Applied Computational Science	Earth Simulator, High-Performance Computing, Multiscale Simulation, Earth Sciences, Lithosphere Dynamics, Earthquakes, Plate Motion, Particle Simulation Method, Scientific Visualization, Evolution of the Earth's Deep Interior, Large Scale Linear and Nonlinear Iterative Solver, Data-driven, Inverse Problem, Bayesian estimation, Sparse Modeling	Tsuboi Seiji
Large Scale Computational Science (Collaborative Program) *	C-9	Large Scale Computational Science	Simulation of Complex Climate System , Numerical Software Library, Quantum Material Science, Lattice QCD, Biosimulation, Cellular Simulation	Imamura Toshiyuki Onami Shuichi Sota Shigetoshi Tomita Hirofumi Nakamura Yoshifumi Yokota Hideo Sato Kento Tsuji Miwako Nishizawa Seiya

*) For the education and research fields of the collaborative program, the research may be conducted at somewhere other than Kobe University. If you would like to enroll in a collaborative program, contact us beforehand for the details. (Contact: Kobe University Graduate School of Engineering, Students Affairs Office)

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