



2025.2026

Graduate School / Faculty of
**Information Science and
Electrical Engineering**

ISEE Kyushu University



Information Science and Electrical Engineering
Kyushu University



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Message from the Dean

— Systems Information Science for Society —

The Graduate School and Faculty of Information Science and Electrical Engineering (ISEE) at Kyushu University was founded in 1996 and reorganized in 2000 into its present dual structure, in which the Graduate School is responsible for education and the Faculty for research. Uniquely among Japan's leading universities, ISEE brings together information science and electrical engineering within a single academic body. This year, we celebrate the 30th anniversary of our founding.

We find ourselves at an extraordinary inflection point. The rapid rise of generative AI, continued advances in quantum computing, the large-scale reshoring of semiconductor manufacturing to Kyushu, and the accelerating global pursuit of fusion energy are reshaping the technological landscape at an unprecedented pace. Japan's 7th Science, Technology and Innovation Basic Plan (FY 2026–2030), approved by the Cabinet in March 2026, has designated AI and advanced robotics, quantum technology, semiconductors and communications, and fusion energy as National Strategic Technology Areas. ISEE's education and research lie at the heart of these national priorities. Notably, the soaring demand for advanced semiconductors and the rapid growth in electrical energy consumption driven by AI are challenges that can only be met through the convergence of information science and electrical engineering — precisely the endeavor we call "Systems Information Science."

Our graduate programs comprise two departments and five specialized courses, producing leading experts in AI, mathematical sciences, and data science alongside professionals who advance the information society and its energy infrastructure through semiconductor devices and energy systems. Our research spans the full breadth of the National Strategic Technology Areas — from generative AI algorithms and quantum bit control to superconducting systems, plasma process technologies, and next-generation power semiconductors — all conducted at the highest international level. These efforts are reinforced by close collaboration with university research centers, including the Center for Semiconductor Human Resource Development through Value Creation, the Quantum Computing System Center, and the Research Institute of Superconductor Science and Systems, as well as by international partnerships such as the Japan–U.S. semiconductor UPWARDS (University Partnership for Workforce Advancement and Research & Development in Semiconductors) initiative.

With our 30th anniversary coinciding with the inaugural year of the 7th Basic Plan, we see this moment as the starting point for a new era. As an institution uniquely equipped to integrate semiconductor technology, AI, and electrical energy, ISEE is dedicated to nurturing researchers and engineers who combine broad intellectual curiosity with a global perspective and a strong sense of ethics — and who will help build a safer, more secure, and more prosperous society.

We look forward to your continued support and guidance.

Takanobu Kiss

Dean and Distinguished Professor
Graduate School and Faculty of
Information Science and
Electrical Engineering,
Kyushu University



Overview

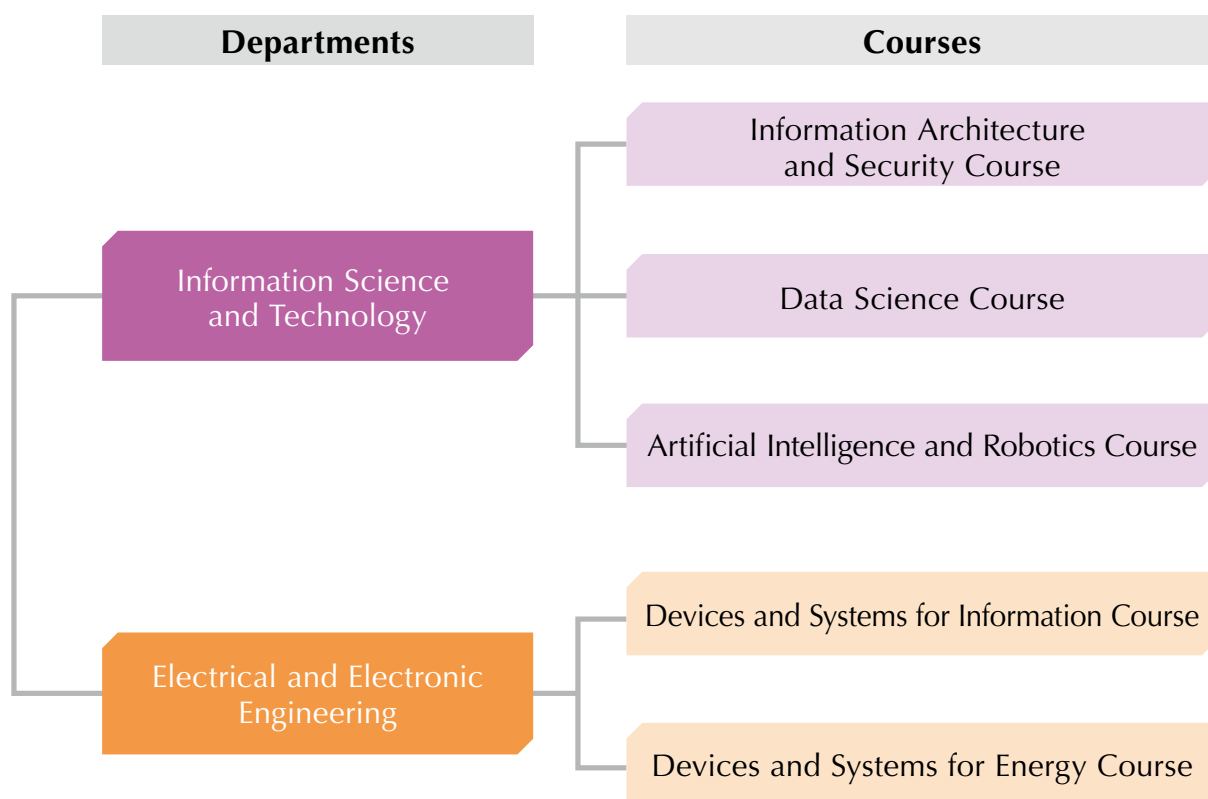
The Aims of the Graduate School of Information Science and Electrical Engineering

Given the sophistication and widespread use of information processing, and information and communication technologies, information science is becoming an extremely important discipline as a fundamental science like mathematics and physics that underpins scientific methodologies. In addition, the results derived from information science deeply penetrate not only all academic fields, from the humanities to science, but also our day-to-day social lives. They also have a great impact on society, culture, and the economy. Electrical and Electronic Engineering has a long history and a large industrial reach. As the mother of the information industry, it has not only always contributed to development, but also created an extremely high-functioning, complex, and large-scale electrical and electronic system which is expected to continue to develop in close cooperation with information science. In light of these social circumstances, the Graduate School of Information Science and Electrical Engineering will cultivate in the next generation of researchers and engineers who have a wide range of intellectual interests, internationality, ethics, and advanced expertise, as well as R&D capabilities in researchers' respective fields.

The Structure of the Graduate School of Information Science and Electrical Engineering

The graduate school comprises the Department of Information Science and Technology where students acquire a systematic understanding of the sophisticated fundamental knowledge of information mathematics, artificial intelligence, data science, software, and computer engineering, and the Department of Electrical and Electronic Engineering, where students gain a systematic understanding of the sophisticated fundamental knowledge of electrical, electronic, and communication engineering. These two departments collaborate and offer diverse educational programs ranging from basics to applications of the new discipline of Shisutemu Joho Kagaku. The two-department system allows for flexible responses to future changes in social needs and educational content. In addition, by structuring departments into courses corresponding to more specific fields, the content to be completed by students is clarified. More specifically, the Department of Information Science and Technology has Information Architecture and Security Course, Data Science Course, and Artificial Intelligence and Robotics Course, and the Department of Electrical and Electronic Engineering has launched Devices and Systems for Information Course and Devices and Systems for Energy Course. Through cooperation between these two departments, researchers will be trained who have the ability to open up and create new fields in the domain of Information Science and Electrical Engineering as well as become advanced professionals with a broad perspective. In addition, we strive to develop engineers and researchers who can propose and solve problems and are rich in internationality, creativity, and autonomy.

Departments and Their Quota of Students



Quota of Students

Departments	Doctoral Course	Master's Course
Information Science and Technology	29	135
Electrical and Electronic Engineering	16	95
Total	45	230

Department of Information Science and Technology

The Philosophy and Admissions Policy of the Department

The Department of Information Science and Technology cultivates professionals who are capable of developing advanced technologies for a highly informatic society and who may provide new insights into information science and technology from an international perspective by systematically teaching and conducting research in information science and technology, that is, a new academic discipline that investigates the nature of various 'information'-related phenomena involving nature, society, and humans. To realise this philosophy, we have divisions in Mathematical Information, Intelligence Science, Computational Science, Advanced Information Technology, Advanced Software Engineering, and Real-world Robotics. In addition, regarding master's courses, three educational programmes are offered which differ based on the expertise being acquired from them:

(1) Information Architecture and Security Course

Students will study and develop advanced technology related to information architecture and security that will form the basis of an advanced informatics society. They will be developed into professionals who possess an international perspective to uncover new horizons for information science and technology.

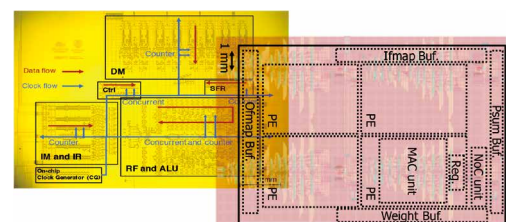
(2) Data Science Course

Advanced data scientists and researchers will be nurtured to become professionals responsible for the foundations of advanced data science.

(3) Artificial Intelligence and Robotics Course

The course will cultivate advanced researchers and engineers who will be responsible for developing new fields in the domains of AI, IoT, and robotics to realise the Cyber Physical System.

Department of Information Science and Technology seeks students who have a deep understanding of the philosophy of the department and who can learn proactively on their own in accordance with its philosophy, more specifically, the ones who engage in research into basic theories while constantly being conscious of practice, who can conduct applied research based on basic theory, who are willing to challenge themselves in new fields, who aim to acquire high-level practical skills in Information Communication Technologies (ICTs), and who aim to acquire advanced technologies in real-world information processing, such as robotics and multimedia processing, and information- and communication-processing mechanisms. We expect to enroll highly motivated students who will tenaciously conduct research with us. In addition, we actively accept students and working people who are willing to acquire advanced specialised knowledge in information science and technology in the doctoral programme, and we strive to train engineers and researchers who will support the future.



Department of Electrical and Electronic Engineering

The Philosophy and Admissions Policy of the Department

The Department of Electrical and Electronic Engineering trains new professionals who, having understanding of the sophisticated basic knowledge of electrical, electronic, and communication engineering, the expertise in using data science and other information technologies, and the ability to create (to think things through), plan (to shape ideas), and persuade (convince people to consider), will work to solve complex issues, in the field of information and communication as well as that of social infrastructure systems centred around energy, with the creativity of advanced expertise, and will lead new R&D and its implementation in response to changes in society, such as Society 5.0.

We provide education on both knowledge and theory related to electric engineering and how to realise and use it in society. Since the master's programme is the last finishing part of the six-year integrated programme, we have two courses corresponding to the fields that realise and use electronic and electrical engineering in society and provide education on knowledge/theory and realization/application in each field to increase expertise. The two courses look at fields that are and will continue to be very important in society. They are the Devices and Systems for Information Course dealing with information hardware, and the Devices and Systems for Energy Course specializing in social infrastructure.

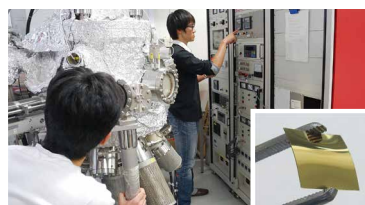
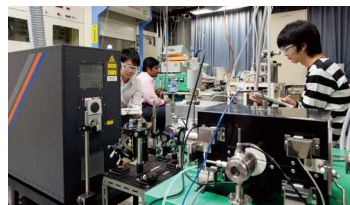
1 Devices and Systems for Information Course

Students will be nurtured to become professional in the field of social infrastructure systems centred on information and communication who can work to resolve complex issues with the advanced expertise of electrical and electronic engineering and can lead new R&D and its implementation in response to social changes such as Society 5.0.

2 Devices and Systems for Energy Course

Professionals will be cultivated, in the field of social infrastructure systems centred on energy, who can work to resolve complex issues with the advanced expertise of electrical and electronic engineering and can lead new R&D and its implementation in response to social changes such as Society 5.0.

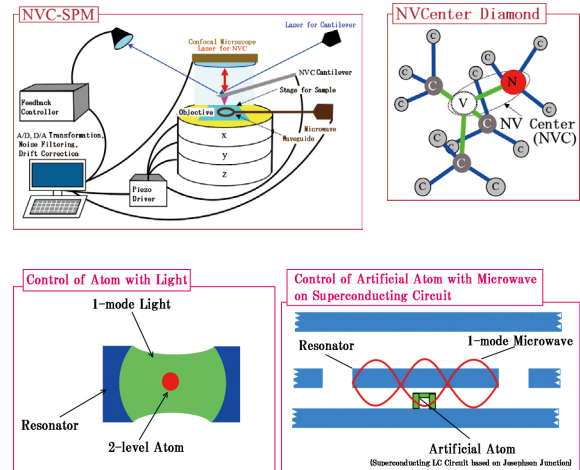
The Department of Electrical and Electronic Engineering accept students who aim to be such researchers and engineers with high motivations to learn by themselves and basic academic skills to develop new areas of technology and new academic disciplines.



Department of I&E Visionaries

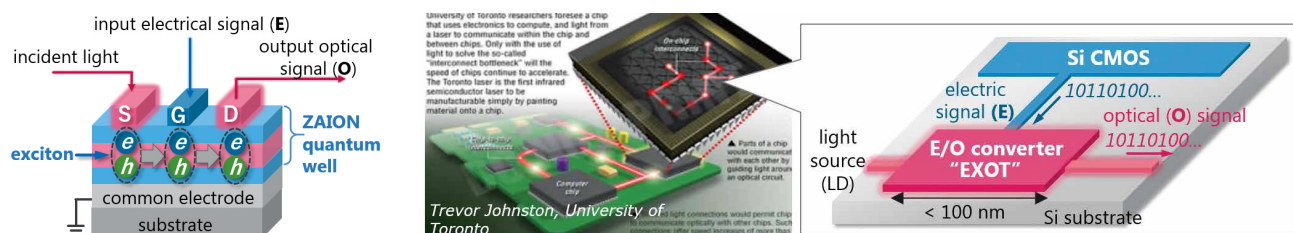
I&E Quantum Computer Science and Technology Group

We make the theoretical study on the physical, engineering problems arising from the control of qubits in quantum computing and quantum sensing. Regarding quantum computation: we study the mathematical structure of several quantum information devices. For instance, the (artificial) 2-level atom controlled with light or microwave is among them. We also make the theoretical research on the modeling of the system of the part from the low phases of quantum compiler to the quantum architecture. Regarding quantum sensing: we study on the computer-control technology such as the control technology of the NVC sensor and the noise-filtering technology to detect faint quantum information buried in several noises. We uphold this theme in the development of the measurement device with the quantum sensor. We aim for implementation of the computer-control technology in the measurement device.



I&E Excitons Research Group

We are developing a new class of transistor “exciton transistor (EXOT)” with a new semiconducting material, $(\text{ZnO})_x(\text{InN})_{1-x}$. Exciton - an electrically neutral quasiparticle- is a bound state of an electron-hole pair attracted by the electrostatic Coulomb force. The most interesting feature of an exciton is that it can be generated by and converted back into a photon within a short time. Thus, EXOTs bring great improvements to the speed of electronic–optical (E/O) conversion along with significant miniaturizations of E/O converters. They will replace electric wiring on computer chips with optics, and lead to high-performance and low-power-consuming data processors!



Department of Interdisciplinary Informatics

At Kyushu University, the Information-related Minor Program was launched in October 2024. This program was established in response to the growing societal demand for digital professionals who can drive digital transformation (DX) across nearly all industries and infrastructure sectors. Its goal is to foster digital talent that transcends the traditional boundaries between the humanities and sciences. The department of interdisciplinary informatics serves as the core entity responsible for the design and implementation of this program and provides information-related education to students across the entire university.

Courses and Subjects of ISEE

The Curriculum Outline of the Graduate School of Information Science and Electrical Engineering

The social and industrial communities point to the scarcity of information and hardware engineers supporting information systems. The primary objective of the present curriculum revision is to cope with this shortage. Social demands for the educational programs of ISEE can be summarized as follows:

1. Requirements for advanced informatics education to cope with the rapid advancement of science related to information technology due to worldwide networking.
 - Education of researchers and engineers who support technological schemes concerned with contents structuralizing from information.
 - Education of researchers and engineers who support the theoretical backbone of information technology.
2. Requirements for ICT specialists, particularly leading researchers and engineers, triggered by infiltration of the social information foundation.
 - Education of researchers and engineers who support the infrastructure basis of the advanced information system.
 - Education of researchers and engineers who support an advanced information

foundation to enhance awareness of interference with the real world, including real-world information processing.

3. Requirements for education accommodating to technological revolution and extending interdisciplinary research in the field of electrical engineering.
 - Education of researchers and engineers who support the physical layer of information and energy.
 - Education of researchers and engineers who support the interdisciplinary area between the information system and the electrical system.

Education in the graduate school of ISEE is conducted by three departments corresponding to the above subjects. Additional courses, according to the field specialty and the educational method, are established in the department to clarify the details of educational contents. Establishment of the courses enables us to educate a wide variety of engineers to satisfy future industrial needs without reorganization of the department. Fundamental ideas of the curriculum for the Master's and Doctoral courses are as follows:

Characteristic Education Methods

- (a) An advisory committee is organized to provide each student with close personalized guidance (Doctoral Program).
- (b) Real PBL (Project-Based Learning) is introduced for practical education.
- (c) Collaboration with industries is established for nurturing leading ICT engineers and introducing leading-edge technologies to the Master's Program.
- (d) Practical English education is provided through lectures in English and international
- (e) PBL.
- (e) A long-term Internship program is introduced in collaboration with industries.
- (f) Lectures and guidance in PBL are given by engineers who are active at the forefront of Industry.
- (g) Subjects on intellectual property management, entrepreneurship, and engineering ethics are available as graduate school common subjects.
- (h) Practical education on safety and ethics is

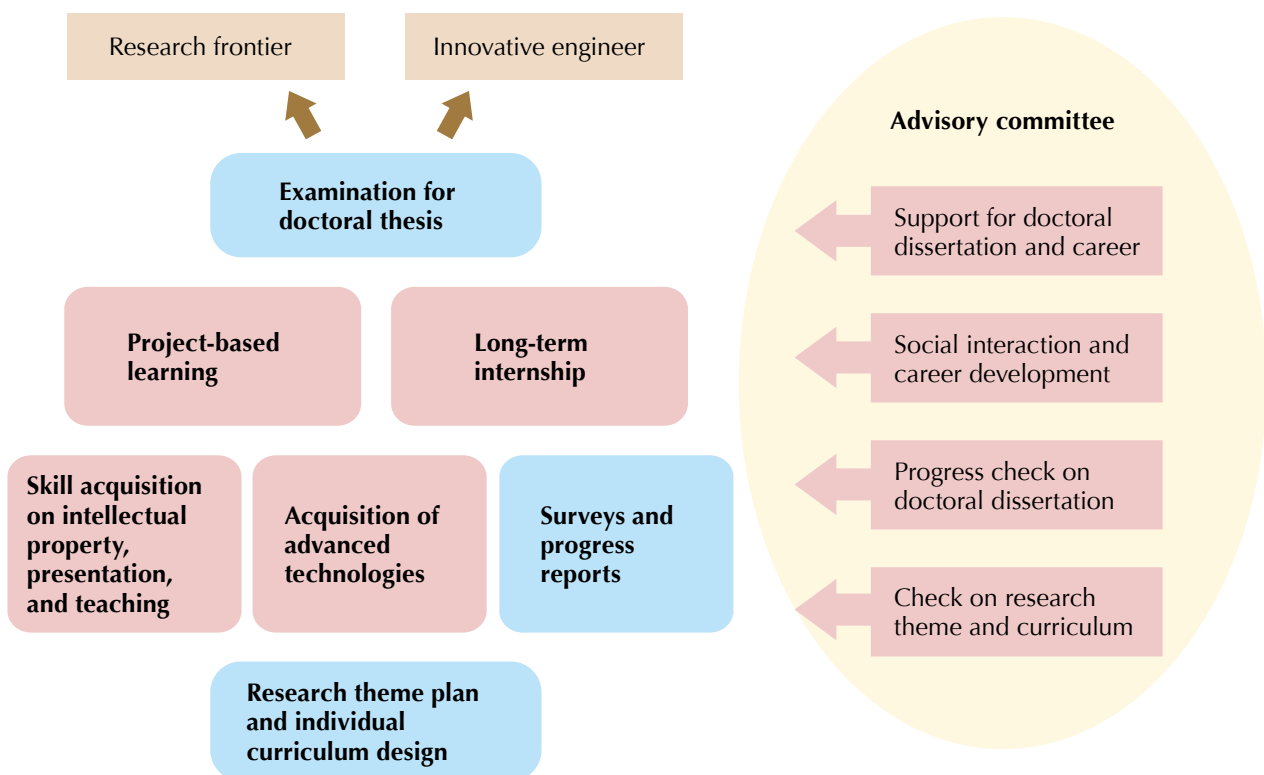
- provided through exercises and experiments.
- (i) Collaboration with the Graduate School of Systems Life Sciences is established.
 - (j) Collaboration with the Graduate School of Mathematics is established to enhance

- education in mathematics.
- (k) Collaboration with the Graduate School of Integrated Frontier Sciences is established to explore new interdisciplinary fields.

Curriculum for Doctoral Course Students

ISEE will organize an advisory committee for each doctoral course student. The advisory committee is composed of several faculty members of ISEE and specialists from companies, universities, and other organizations. The committee first designs an individual curriculum according to the research

theme of the student, then checks his/her progress periodically and suggests appropriate direction. The committee will also offer advice on possible career paths. The curriculum offers opportunities to learn intellectual property and teaching skills and to serve in authorized long-term internships.



Curriculum for doctoral course students

Admissions for International Students

Graduate Programs:

Master's Program

The practical education system established for the Master's Program emphasizes experiments, exercises, discussion, and course work. To develop interdisciplinary intellectual power, each student should select one extended area and take classes from the designated extended subjects in addition to those for his/her major field. Minimum required credits are 45. The completion of a thesis is also required. A two-year program is standard.

Doctoral Program

Students enrolled in the doctoral course can concentrate on their own research. To support the progress of their research, ISEE will organize an advisory committee for each student composed of several faculty members and specialists from companies, universities, and other organizations. The curriculum offers opportunities to learn intellectual property and teaching skills and to serve in authorized long-term internships. It typically takes three years to complete the program though students can shorten the period depending on their research achievements.

The Global Course:

ISEE opens the Global Course to master's and doctoral students. Students who select this course at the time of entrance can complete their course in English.

Job Opportunities:

There are many job offers for the graduates of ISEE from companies across a wide range of industries in Japan. Ph. D. students can find research positions not only in companies but also in national institutes and universities. The following is a partial list of organizations where *foreign students* have found jobs over the last four years: Asahi Kasei, Buffalo, Daikin, Denso, DNP, Fujitsu, Hitachi, Ibiden, KDDI, Kubota, Kyocera, Mitsubishi, NEC, Nichicon, Nifty, Nikon, Nissan, NTT, Omron, Renesas, SEI, TMEIC, Toshiba Solutions, Ulvac, Yahoo, and others.

Admission:

Master's Program

The time of entrance is April and October. Entrance examinations for foreign students are scheduled for August of the previous year.

Doctoral Program

The program begins in April and October with selection scheduled for late February and late July, respectively. Visit website for details.

MAPS



Near West Bldg. 2, where the Graduate School of Information Science and Electrical Engineering is located

The Graduate School / Faculty of Information Science and Electrical Engineering moved to the new Ito Campus in October 2006. The Graduate School / Faculty of Information Science and Electrical Engineering, the System LSI Research Center have a satellite campus in the Momochi area, where IT industries accumulate. The System LSI Research Center also opened a satellite campus in Itoshima area in accordance with the establishment of Experimental Center for Social System Technologies, which is managed by Fukuoka Prefecture.



Graduate School / Faculty of Information Science and Electrical Engineering Kyushu University

<https://www.isee.kyushu-u.ac.jp/e/>

Printed by Kijima Printing, Inc. July, 2026



Ito Campus: 744 Motooka, Nishi-ku, Fukuoka 819-0395

- Office of the Department of Informatics
Tel: +81-92-802-3801
- Office of the Department of Advanced Information Technology
Tel: +81-92-802-3601
- Office of the Department of Electrical and Electronic Engineering
Tel: +81-92-802-3701
- Graduate School / Faculty of Information Science and Electrical Engineering
Fax: +81-92-802-3600
- Educational office of the Department of Electrical Engineering and Computer Science
Tel: +81-92-802-3711 Fax: +81-92-802-3710

Momochi Satellite Campus: Fukuoka Institute of System LSI Design Industry 3F, 3-8-33 Momochihama, Sawara-ku, Fukuoka 814-0001

- Satellite Office
Tel: +81-92-847-5190

Itoshima Satellite Campus: Experimental Center for Social System Technologies, 1963-4 Higashi, Itoshima, Fukuoka 819-1122

- Satellite Office of the System LSI Research Center
Tel: +81-92-332-8006