

Graduate School of Engineering,  
Nagasaki University  
Master's Degree  
Application Guidelines

Department of Advanced Engineering

2022, April Entrance  
( Winter Application )

**Entrance Examination for International Students**

Nagasaki University, Graduate School of Engineering

Bunkyo 1-14, Nagasaki, 852-8521, Japan

TEL: (095) 819-2491 (Direct)

FAX: (095) 819-2587

**\*Note**

Guidelines for "Water and Environment Engineering Program" are not provided in this brochure. Please check our website or contact us.

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## \*Note

Guidelines for “Water and Environment Engineering Program” are not provided in this brochure. Please check our website or contact us.

Website (Japanese): [http://www.eng.nagasaki-u.ac.jp/contents/01\\_02\\_g\\_ar.html](http://www.eng.nagasaki-u.ac.jp/contents/01_02_g_ar.html)

Website (English): [http://www.eng.nagasaki-u.ac.jp/english/contents/01\\_g\\_admission.html](http://www.eng.nagasaki-u.ac.jp/english/contents/01_g_admission.html)

# Admission Policy of the Department of Advanced Engineering Graduate School of Engineering, Nagasaki University

## **1. Educational Philosophy and Aim of the Graduate School of Engineering**

(Educational Philosophy)

As an educational and research base for advanced engineering which coexists with nature and commits to the sustainable development of human society, the Graduate School of Engineering will foster highly professional engineers and researchers who possess professional and interdisciplinary knowledge along with as high expertise across a wide range of engineering topics, and who will be able to play an active role in the international field. We will also contribute to promoting innovative science and technology of next generation through conducting pioneering and innovative research.

(Aim)

To develop in students professional and interdisciplinary knowledge along with high expertise across a wide range of engineering topics, and to cultivate their skills to explore and solve problems as well as their capabilities to conduct internationally pioneering research and development.

## **2. Educational Philosophy and Aim of the Department of Advanced Engineering of the Graduate School of Engineering**

The educational philosophy of the Department of Advanced Engineering, the Graduate School of Engineering is as follows: "As an education and research base for engineering that contributes to the development of technological society in coexistence with nature, we foster engineers who possess highly professional and practical skills and who will be able to play an active role globally, and we also promote innovative research to create a diversified intellectual asset." We accept graduates mainly from the School of Engineering and nurture their skills as highly professional engineers and researchers who can meet the demands of industrial society. Therefore, our educational aim is to foster highly professional engineers and researchers who can meet the demands with a high degree of internationality.

## **3. Admission Policy of the Department of Advanced Engineering of the Graduate School of Engineering**

The Department of Advanced Engineering expects its students to possess the following academic skills, competencies and attributes:

- High-level and fundamental academic skills in either discipline of engineering: Mechanical Engineering, Electrical and Electronic Engineering, Computer and Information Science, Structural Engineering, Civil and Environmental Engineering, Chemistry and Materials Engineering, or Water and Environmental Engineering.
- Willingness to contribute to the development of technological society that coexists with nature.
- Willingness to acquire advanced professional knowledge and skills as well as to conduct innovative research

which will invent a wide range of intellectual asset.

- Sense of ethics and high security awareness required to be a highly professional engineer and/or researcher.
- Strong willingness to help respond to the demand of industry and society.
- Knowledge and skills to explore and solve problems across a wide range of engineering topics.
- Communication skills in a global context.

#### Appendix about the Screening Method

Evaluation methods for the required aptitude and its priority (most prioritized : ⊙, prioritized : ○)

Expected Competencies		High-level fundamental academic skills in engineering	Willingness to contribute to the development of technological society that coexists with nature	Willingness to acquire advanced professional knowledge and skills as well as to conduct innovative research which will invent a wide range of intellectual asset	Sense of ethics and high security awareness required to be a high professional engineer and/or researcher	Strong willingness to help respond to the demand of industry and society	Knowledge and skills to explore and solve problems in a wide range of engineering topics	Communication skills in a global context
General Examination (Excluding Water and Environmental Engineering Program)	Writing	⊙					○	○
	Submitted Documents	○					○	○
	Interview		○	○	○	○		○
General Examination/ Examination for International Students (Water and Environmental Engineering Program)	Oral Examination	⊙					○	○
	Written examination (essay)	○					○	○
	Interview		○	○	○	○		⊙
Admission Examination on Recommendation (Excluding Water and Environmental Engineering Program)	Official Transcript	○					○	
	Oral Examination	○					○	
	Interview		○	○	○	○		○
Examination for International Students (Excluding Water and Environmental Engineering Program)	Oral Examination	○					○	○
	Interview		○	○	○	○		⊙

## 1. Number of Students to be Admitted

Field	Course	Number of Students to be admitted
Department of Advanced Engineering	Mechanical Engineering Program	Several
	Electrical and Electronic Engineering Program	
	Computer and Information Science Program	
	Structural Engineering Program	
	Civil and Environmental Engineering Program	
	Chemistry and Materials Engineering Program	

## 2. Application Requirements

Non-Japanese citizens (excluding foreigners with Japanese permanent permit) who falls into any of the following requirements.

- (1) Those who have completed (or will complete by March, 2022) 16 years of standard school education in countries other than Japan.
- (2) Those who have completed (or will complete by March, 2022) 16 years of standard school education, in Japan, through the completion of required correspondence courses, conducted by an authorized school outside of Japan.
- (3) Those who have completed (or will complete by March, 2022) 16 years of standard school education after completing postgraduate courses at the foreign education institutes in Japan, recognized by the Ministry of Education, Culture, Sports, Science and Technology.
- (4) Those who have an academic degree equivalent to Bachelor degree or are expected to be conferred by March 2022 by completing a three-year or longer program at a foreign university or other foreign educational institution. The university or educational institution must have been accredited by the respective foreign government or a person certified by the appropriate foreign governmental agency, or have been so designated by the Minister of Education, Culture, Sports, Science and Technology of Japan. (This includes applicants who have completed an appropriate program offered by the respective foreign educational institution through corresponding course while residing in Japan and applicants who have completed an appropriate foreign educational program at educational institution in Japan as specified in the previous category)
- (5) Those have an academic degree equivalent to or higher than Bachelor's Degree approved by this graduate school through individual preliminary screening, and will be at least 22 years of age by March 31, 2022 (Refer to "3. Eligibility Preliminary Screening")

## 3. Eligibility Preliminary Screening

- (1) Applicants applying under the "Application Requirements" (5) must submit the following documents to the Student Affairs Section for Graduate School of Engineering by October 22, 2021 (Fri) for the preliminary screening of the application eligibility.

Submission Documents	Note
Certified (original) copy of Graduation Certificate / Expected Graduation	Issued under the authority of the president of the university where applicant graduated from. No copy of diploma is acceptable.

Official Transcript	Issued and officially sealed under the authority of the president of the university where applicant graduated from
Application for Preliminary Screening	Prescribed Application Form by this graduate school
Application Form	Prescribed Application Form by this graduate school
Certificate of Research Career	Prescribed certification form by this graduate school and verified by the head of the institution.
Outline of Research Content	Prescribed form by this graduate school
Return Envelope for Eligibility Preliminary Screening Results (12 cm × 23.5 cm)	A self-addressed return envelope with ¥374 worth of stamps affixed (Express Mail)

Prescribed application form is available for downloading from the following website of the Graduate School of Engineering, Nagasaki University. (URL : [http://www.eng.nagasaki-u.ac.jp/english/contents/01\\_g\\_admission.html](http://www.eng.nagasaki-u.ac.jp/english/contents/01_g_admission.html))

(2) The results of Eligibility Preliminary Screening will be sent to applicants by November 11, 2021 (Thu).

Those who are deemed eligible for application must follow the procedures set out in “4. Application Period” and “5. Application Procedure”.

#### 4. Application Period

From November 22, 2021 (Mon) to November 29, 2021 (Mon)

(1) The application documents must be sent as registered express mail and delivered no later than November 29 (Mon).

Address: Student Affairs Section for the Graduate School of Engineering West District Division, Nagasaki University, 1-14 Bunkyo, Nagasaki, 852-8521

(2) Applicants who would like to submit the application documents in person please come to the student affairs section between 9:00-17:00, except weekends and national holidays.

#### 5. Application Procedure

The applicants shall submit the application documents listed below to the Student Affairs Section for the Graduate School of Engineering West District Division, Nagasaki University by the designated date.

\*Prior to submit application, applicants must directly contact their chosen academic advisor for the approval to receive guidance after admission.

\*Prescribed application form is available for downloading from the following website of the Graduate School of Engineering, Nagasaki University.

(URL : [http://www.eng.nagasaki-u.ac.jp/english/contents/01\\_g\\_admission.html](http://www.eng.nagasaki-u.ac.jp/english/contents/01_g_admission.html))

\*The “Bank Payment Form” and “Address Sticker” are available to pick up at Student Affairs Section for the Graduate School of Engineering West District Division, Nagasaki University. Those who have difficulty visiting the office may claim via the mail. (Refer to 16. other)

Submission Documents	Note
Application Form (designated by the Graduate School of Engineering)	Make sure to mention the name of your desired course and academic advisor. ( Except for those already submitted for the eligibility preliminary screening )

Photo Card / Admission Ticket / Payment Certificate for the Entrance Examination Fee (designated by the Graduate School of Engineering)	Make sure to mention the name of your desired course.
Certified (original) copy of Graduation Certificate / Expected Graduation Certificate (written in Japanese or English)	Issued under the authority of the president of the university where applicant graduated or is expected to graduate from. No copy of diploma is acceptable. Except for those who already submitted for the eligibility preliminary screening. A person who falls under the requirement (4) and whose certificate does not indicate that the person has been conferred an academic degree equivalent to Bachelor degree needs to submit a degree conferral certificate separately.
Official Transcript (written in Japanese or English)	Issued under the authority of the president of the university where the applicant graduated from. (Not necessary if already submitted for eligibility preliminary screening). In addition, the standard list for credits issued by the university must be submitted.
Any proof of acceptance by your academic advisor-to-be	Any documents (EX. copy of e-mail) to prove the acceptance by your academic advisor-to-be at Nagasaki University.
Proof of Status of Residence (photocopy)	Submit a photocopy of applicant's resident card or passport (where the entry visa is shown).
Entrance Examination Fee (JPY 30,000)	<p>[Payment Period] From November 22, 2021 (Mon) to November 29, 2021 (Mon)</p> <p>[ Payment Places ] At any bank. Note: Payment must be made at the counter in the bank. Payment through ATM is not available</p> <p>[ Payment Method ] Bank transfer only. Applicants must fill in their name, address, telephone number correctly with a black or blue inked pen in the ※-marked boxes on the supplied payment transfer form. Additional transfer fee will be borne by the applicants. Please make sure the payment certificate has a seal of the handling bank.</p> <p>[ Important Notice for your application ] Applications will not be accepted if the payment for the Entrance Examination not been made by the specified date, or missing of the bank seal on the payment certificate, or the payment certificate not been attached in the [Form 2] . If you make the payment on the last day, remember to submit all the application documents by 17:00 on the day. (Please make sure the business hours of the bank.) The Entrance Examination Fee is not refundable except for the following circumstances. The payment has been made but did not apply (Either did not submit the application or the application been refused), or accidentally made the payment twice. In principal, applicants shall bear the cost of refund Request for the refund must be made within 14 days from the last day of the application period. [Inquiries regarding refunds] Finance Management Division, Finance Department, Nagasaki University (TEL +81-95-819-2060)</p> <p>* Overseas students on Japanese government (Monbukagakusho: MEXT) scholarship are not required to pay the fee.</p>

Required	<Structural Engineering applicants only> Official Score Certificate (Original) of any of following tests. “TOEIC® Listening & Reading Test”, or “TOEFL iBT®”	The official score certificate is only valid if obtained within the past 3 years from the examination date ( <del>Applicants without any of those official score certificates are not eligible for taking the entrance examination.</del> ) The official score certificate will be returned enclosed along with the admission exam ticket.  If any of the certificates listed on the left are not available in time, or if you are able to submit recently obtained certificates other than those submitted at time of application, please submit it to the Student Affairs Section by noon of the day before the examination.
Address Sticker	Applicant's name, postal code and the residential address must be clearly written. Any changes occurred after application submission must be notified to the Student Affairs Section immediately.	
Return Envelope for the Admission Exam Ticket (12 cm × 23.5 cm)	Applicant's name, postal code and the residential address must be clearly written on the envelope with JPY 374 worth of postal stamp affixed. (Express Mail )	

## 6. Application Precautions

- (1) Changes to the content of applications are not permitted once application procedures have been completed.
- (2) Application documents shall not be returned for any reason.
- (3) Upon applying, candidates are strongly recommended to consult their prospective academic advisors about their research theme and the language used in lectures.

## 7. Screening Method

Enrollees are selected through an interview and an oral examination in each program.

### (1) Examination Date and Time

Course	Date	Time	Subject
Mechanical Engineering Program	December 14 (Tuesday)	From 10:00	Interview and oral examination
Electrical and Electronic Engineering Program			
Computer and Information Science Program			
Structural Engineering Program			
Civil and Environmental Engineering Program			
Chemistry and Materials Engineering Program			

### (2) Acceptance Criteria

Interviews and oral examinations are evaluated using the following methods and successful applicants of each course are selected respectively in the order of their total scores. However, applicants must score a minimum of 60 points.

#### [Method of Evaluation]

Individual interviews are held by multiple examiners. ① and ② below are added to give scores of up to a maximum 100 points.

- ① Applicants are asked questions in reference to their application documents and are evaluated on topics such as motives behind application, motivation to study, general knowledge, and social skills. (Allocation of 30 points).
- ② An oral examination will be conducted by the method shown in the table below, and a comprehensive assessment will be made on basic academic skills, expertise, and Japanese language proficiency. (Allocation of 70 points).



Course	Evaluation methods for the basic academic skills, expertise, and Japanese language proficiency
Mechanical Engineering Program	Evaluate the degree of understanding of the research background and significance, as well as the level of basic and specialized knowledge and competence through having applicants explain the graduation research or equivalent study activities. In addition, non-English natives will be evaluated their understanding level of Technical English.
Electrical and Electronic Engineering Program	Evaluate basic academic skills, specialized knowledge, and Japanese proficiency through questioning the contents of current research and the description of future research perspectives
Computer and Information Science Program	Applicants' basic academic skills, technical English, mathematics, expertise in hardware and software are evaluated through personal interviews in Japanese.
Structural Engineering Program	Applicants' basic academic skills will be evaluated based on English and Mathematics and Structural Mechanics and Material Mechanics will be evaluated as the expertise. The official score of any one of "TOEIC® Listening & Reading Test", or "TOEFL iBT®" (*1) is used as a reference for evaluation.
Civil and Environmental Engineering Program	Applicant's basic academic skills are evaluated by means of mathematical and English proficiency. As for expertise, any one of subjects of structural mechanics, Soil mechanics, Hydraulics or urban planning that applicant choose at the time of application will be evaluated.
Chemistry and Materials Engineering Program	To evaluate the applicant's basic academic skills by means of English language, chemistry, physics, and mathematical level. To evaluate the applicant's specialized knowledge regarding a basic subject of a specialized field by asking questions from any of the fields such as physical chemistry, organic chemistry, inorganic chemistry, analytic chemistry, polymer (material) chemistry, metallic materials technology, inorganic materials technology, solid-state physics, or biochemistry, in consideration of the desired field of the applicant.

(\*1) The evaluation of English proficiency may be changed depending on the implementation status of "TOEIC® Listening & Reading Test Public Test" or "TOEFL iBT®".  
Please make sure to check on the website of the Graduate School of Engineering, Nagasaki University for further notification.  
(URL : [http://www.eng.nagasaki-u.ac.jp/english/contents/01\\_g\\_admission.html](http://www.eng.nagasaki-u.ac.jp/english/contents/01_g_admission.html))

## 8. Examination Venue

Graduate School of Engineering, Nagasaki University 1-14 Bunkyo, Nagasaki, 852-8521

## 9. Precautions on Taking the Examinations

- (1) Please make sure your rendezvous point for the examination in the afternoon of the previous day. (Please note that entering class room is prohibited.)
- (2) Applicants must bring the Admission Ticket issued by the Graduate School of Engineering on the day of the examination.

- (3) Applicants must be at the designated rendezvous point 20 minutes before examination starts. (Latecomers will not be permitted to take the examination.)
- (4) All cellular phones must be turned off before entering the examination room.
- (5) Applicants from distant areas need to plan the trip carefully in consideration of possibilities of the inconveniences caused by the weather conditions. The examination date may be postponed in case of unforeseen event such as natural disaster on the day of the examination.
- (6) In principle, no supplementary examination will be available, however, it may be conducted depending on the infection status of the COVID-19. In addition, in case of unforeseen event, a re-examination may be conducted.

## 10. Announcement of Successful Applicants

January 13, 2022 (Thu) at 10:00

\* The results for the successful applicant(s) will be notified through mail and also announced on the Graduate School of Engineering bulletin board on the day.\* Also successful applicant(s) will be listed on the homepage of Graduate School of Engineering, Nagasaki University from 10:00 AM on the day.

([http://www.eng.nagasaki-u.ac.jp/english/contents/01\\_g\\_admission.html](http://www.eng.nagasaki-u.ac.jp/english/contents/01_g_admission.html))

※ Inquiries regarding the examination results will not be accepted over the phone.

## 11. Enrollment Procedures

Successful applicants shall proceed with the admission procedure as follows. The procedural documents will be enclosed with notification of the examination result.

### (1) Procedures Period

From February 7, 2022 (Mon) to February 9, 2022 (Wed) 9:00 - 17:00

### (2) Payment of Fees

• Enrollment Fee : JPY 282,000

(Note) Enrollment fees shall not be refunded once paid.

[Additional Information]

- ① Tuition fee for 2021 (annual fee): JPY 535,800  
(The 1st semester: JPY 267,900 / The 2nd semester: JPY 267,900)
- ② The time of payment for the 1st semester is April and for the 2nd semester is October.
- ③ If the amendment of tuition fee has been conducted, the new tuition fee will apply from the date of revision
- ④ The Exemption of deferment of enrollment fee and tuition fee will be available.(Details will be enclosed with the procedural documents)
- ⑤ Admission and tuition fees are not required for international students supported by Japanese government (Monbukagakusho: MEXT) scholarships.

## 12. Handling of Personal Information

- (1) Obtained personal information is used for selecting enrollees. The personal information of successful applicants and enrollees are used for enrollment procedures, and the student registration.
- (2) The grades of the entrance examination and other personal information are used as the references for the recommendation of the 1st year scholarship students, as well as for the selection of the applicants for exemption of entrance fee and tuition fee.
- (3) Obtained personal information for the selection of enrollee and for the entrance examinations are also used in statistical surveys and research related to the selection of enrollees.
- (4) Obtained personal information for the selection of enrollee and for the entrance examinations are not used for the purposes other than the purposes mentioned above nor to provide to the third parties, except

the case as provided in Article 9 of “Act on the Protection of Personal Information Held by Independent Administrative Agencies”.

### **13. For Applicants Requiring Disability-related Accommodations**

Applicants with disabilities who require assistance or special care with their entrance examination as well as attending classes may consult with the Student Affairs Division of Graduate School of Engineering. The application (No specific form) should include the following information and be submitted along with a medical certificate by November 5, 2021. Applicants will never be negatively affected in the screening process by the results of an advance consultation. If necessary, an interview may be held with the applicant or the spokesperson from the university where the applicant received his/her last degree. Failing to apply in advance may result in no assistance provided.

The necessary information described on the application form

- (1) Category of the Entrance Examination and the name of the course you apply
- (2) Type and condition of disabilities
- (3) Description of assistance request at the entrance examination
- (4) Description of the assistance request after enrollment
- (5) The assistance service received at the former academic institute
- (6) Additional information
- (7) Name, Address, and the Contact Phone Number (FAX Number)

☆ Nagasaki University Student Accessibility Office will support students and applicants with disabilities.

### **14. Security Export Control**

Nagasaki University performs the Security Export Control under the "Foreign Exchange and Foreign Trade Act (FEFTA)" in order to prevent from obstructing the maintenance of international peace and security due to the education and research content that provide to overseas students.

Thus, please keep in mind that applicants might be requested to change the content of their desired education or research.

Please inquire at each department for more detail.

### **15. Measures on the Novel Coronavirus Infection**

Before submitting your application, should you aware that the following measures may be taken depending on the situation of spread of the COVID-19. The examination date may be postponed or the selecting method may be changed ( Ex.Interviews may be conducted online) and additional examination may be conducted. Further more, the postponement of the examination date will be announced on the website of the Graduate School of Engineering, Nagasaki University.

(URL : [http://www.eng.nagasaki-u.ac.jp/english/contents/01\\_g\\_admission.html](http://www.eng.nagasaki-u.ac.jp/english/contents/01_g_admission.html))

### **16. Other Information**

If you are to request the “Bank Payment Form” and the “Address Sticker” via the mail, ensure to enclose a self-addressed envelope (24 cm × 33 cm) with 120 Yen worth of postal stamp affixed and send it to the Student Affairs Section for the Graduate School of Engineering West District Division, Nagasaki University with the envelope " Request for Application documents" written in Red.

Inquiry:

Student Affairs Section for the Graduate School of Engineering West District Division, Nagasaki University 1-14 Bunkyo, Nagasaki, 852-8521

## Diploma Policy

Master's Degree of Engineering will be conferred on a student who has been enrolled in the Graduate School of Engineering for more than two years, and who has earned the credits (more than 30 credits) prescribed in the educational program (refer to [1]). The student must also be recognized to have the following skills and attributes:

- Truly professional knowledge, diversified academic knowledge, professional practical skills, technical innovation skills and problem solving skills in either discipline of Mechanical Engineering, Electrical and Electronic Engineering, Computer and Information Science, Structural Engineering, Civil and Environmental Engineering, Chemistry and Materials Engineering, or Water and Environmental Engineering

- Willingness to contribute to the development of technological society in coexistence with nature

- Highly professional practical skills and global perspectives

In addition to the above, the student's master's thesis must meet the requirements for a degree conferral (refer to [2]).

[1] A student who has achieved outstanding performance might be conferred degree even if he/she has been enrolled only for one year.

[2] The Master's thesis must be relevant to engineering and must have academic value in creativeness, applicability and demonstrability.

## Curriculum Policy

- There are 7 specific programs available: Mechanical Engineering, Electrical and Electronic Engineering, Computer and Information Science, Structural Engineering, Civil and Environmental Engineering, Chemistry and Materials Engineering, and Water and Environmental Engineering. Each program defines its mandatory classes and elective classes depending on its study field and nurtures students' knowledge and skills in each discipline. Students can also acquire a wide range of interdisciplinary knowledge through taking classes offered by other programs or other courses (refer to [3]).

- "1) Advanced Fundamental Course", "2) Practical English Course" and "3) Practical Course for Engineers and Researchers" are the common courses regardless of which program the student is enrolled in. Each course will respectively nurture 1) fundamental knowledge of mathematics and physics, 2) communication skills in English and 3) basic knowledge of industry, intellectual property and environment. These common courses also aim to nurture students' willingness to contribute to the development of technological society as well as to develop their global perspective.

Academic achievement will be measured by submitted report, oral examination, writing examination, presentation and debate, depending on the contents of each course.

- "Program-Customized Special Course" will develop highly professional knowledge on each program as well as practical skills through participating in practical activities.

Academic achievement will be measured by submitted report, oral examination, writing examination, presentation and debate, depending on the contents of each course.

- "Advanced Specialized Course" will develop further professional knowledge and will cultivate excellent skills to create technology and to solve problems.

Academic achievement will be measured by submitted report, oral examination, writing examination, presentation and debate, depending on the contents of each course.

[3]: According to the students' interest

Please refer to the website of the Graduate School of Engineering, Nagasaki University for the Curriculum Policy of each program.

## Study Descriptions of Each Program

Program / Study Field		Study Descriptions
Mechanical Engineering Program	Machines and Humans	Study on restructuring of mechanical engineering from the viewpoint of “machines which make humans happy” (industrial machines, basics of robot development, welfare machines, biomechanics, etc.)
	Machines and Environment	Study related the development of machines which supports the foundation of maintenance and development of modern society and contributes to development of a better environment (eco-friendly energy devices, renewable energy, alternative energy, etc.)
Electrical and Electronic Engineering Program	Electric Energy Basics Study	<ul style="list-style-type: none"> <li>• Clarification and applications of high-voltage phenomena (stained surface discharge, ozonizer, etc.)</li> <li>• Basics and applications of plasma (plasma processing, laser applied measurement, etc.)</li> </ul>
	Control System Study	<ul style="list-style-type: none"> <li>• Control theories and applications (microcomputer control, optimal control, etc.)</li> <li>• Electric devices and applications (development and control of new type of motors, electromagnetic field analyses, etc.)</li> </ul>
	Electronic Circuit Device Study	<ul style="list-style-type: none"> <li>• Power electronic circuits (inverter, converter, active filter, etc.), basics and signal processing of intelligent electronic devices (CPU, DSP, etc.) and their applications to control systems, etc.</li> <li>• Magnetics (development of magnetic materials for micro machines, computer simulation of magnetic characteristics, applications of magnetic materials, etc.)</li> </ul>
	Telecommunication Engineering	<ul style="list-style-type: none"> <li>• Telecommunications using electromagnetic waves (Design of high functional antennas, Ultra wideband (UWB) and Sensor network etc.)</li> <li>• Theoretical analyses of electromagnetic waves (scattering analyses / inverse scattering analyses of electromagnetic waves, meta materials, etc.) and their applications (imaging using microwaves, microwave mammography, concrete radar, polarization synthetic aperture radar, target identification by radar, target tracking, bio-information monitoring, etc.)</li> </ul>
	Frontier Engineering (optical and high frequency devices)	<ul style="list-style-type: none"> <li>• Ultra-fast optical communication devices (optical devices, optical waveguides, micro and nano fabrications in the clean room, ultra-fast optical communication system, mm wave electrode design, the device for single photon quantum key distribution)</li> <li>• Optical fiber sensor network(remote and distribution detection of pandemic virus based on optical waveguide sensor and fiber, optical detection of organophosphorus compound such as sarin and insecticide using living green fluorescent protein doped glass waveguide)</li> <li>• Living cell laser (unprecedented improvement of resolution of fluorescent microscope using lasing inside living cell)</li> </ul>

Program / Study Field		Study Descriptions
Computer and Information Science Program	Computer Engineering	Studies on information extraction, computer architecture, real-time information processing, network performance assessment, distributed artificial intelligence, programming languages, network applications, etc.
	Mathematical / Application Software Engineering	Studies on computer vision and pattern recognition technologies, machine learning, information retrieval, data clustering, mathematical modeling and optimization techniques, number theory and its application to cryptography, etc.
	Applied Information Systems	Studies on signal and image processing, bandwidth compression, digital watermarking, computer graphics, human-computer interaction, acoustics, speech and natural language processing, remote sensing, data mining, intelligent robot, etc.
Structural Engineering Program		<ul style="list-style-type: none"> <li>• Development of braking devices for structures and machines, vibration analyses of automotive drive systems and motors</li> <li>• Study on development and evaluation of remote measurement methods for deformation investigation and monitoring of infrastructure structures</li> <li>• Study on anti-seismic designing of reinforced concrete structure and steel-concrete composite structure buildings</li> <li>• Study on living environment management, urban landscape structures, and maintenance of traditional villages and houses</li> <li>• Evaluation and improvement on wholesomeness, comfort and energy saving efficiency of living environment</li> <li>• Development of high quality maintenance and repair technology of infrastructure, and development of diagnostic technology for its social implementation</li> <li>• Advancement of evaluation method for material and construction performance toward improving quality and productivity of concrete structures</li> <li>• Development and multidisciplinary analysis for flexible aerospace structural system</li> </ul>
Civil and Environmental Engineering Program		<ul style="list-style-type: none"> <li>• Evaluation of dynamic characteristics of ground materials, study on ground environment evaluation methods, development of designing / maintenance technologies for ground and rock structures.</li> <li>• Development of technologies for static / dynamic analyses, designing and maintenance of civil engineering structure</li> <li>• Social technologies for urban planning, urban designing, and town development</li> <li>• Study on environmental vibration control, environmental measurement, landscaping, civil engineering design, etc.</li> <li>• Study on environmental assessment and improvement of semi-closed seas and lakes, hydraulic structures, etc.</li> <li>• Study on numerical analyses on water environment changes, evaluation and reduction of pollution load, water purification methods, etc.</li> <li>• Applied study by means of remote sensing and GIS</li> <li>• Study on natural disasters</li> </ul>

Program / Study Field	Study Descriptions
Chemistry and Materials Engineering Program	<ul style="list-style-type: none"> <li>• Development and electronic theory of energy conversion semi-conductors, analyses of material micro-structures / lattice defects by high resolution electron microscope, material phase transformation and atom migration mechanism, development of electro-deposited ferromagnetic metal nano materials, development of functional materials utilizing low melting metals, semi-conductor gas sensors, functional ceramics, and surface modification of ceramics</li> <li>• Development of highly functional ionic polymers, biodegradation of plastics, development of environmentally feasible plastics, development of inorganic-organic hybrid polymers, development of functional carbon materials, development of structural fine ceramics, development of inorganic composite materials, solid catalytic chemistry, catalyst preparation by plasma and ultrasonic waves</li> <li>• Development of energy device materials (battery, capacitor, ionic materials), development of absorptive / catalytic materials, synthesis and applications of optically functional compounds, characteristics of polynuclear metal complexes, photo chemistry of metallic complexes, activation of small molecules with transition metal complexes, functional development and spectro-electro chemistry of dynamic nano molecular organization / ultra-thin films / electrode interfaces, development of functional elastomers and adhesives, etc.</li> <li>• Development of transition metal catalytic reactions (organic synthesis, physical organic chemistry, bioactivation), high-efficiency organic synthesis by uniform transition metal complex catalysts, protein engineering (artificial enzymes / modifying enzymes), development of highly selective lithium reactions of organic molecules, development and total synthesis of methodology for efficient synthesis of natural substances, structural analyses of bioactive proteins, new function development by genetic engineering methods, etc.</li> </ul>
Water Environment Engineering Program	<ul style="list-style-type: none"> <li>• Membrane-based water treatment technologies and analytical techniques to produce high-quality and reliable recycled water</li> <li>• New materials such as new catalyst and nano-particle for water treatment</li> <li>• Appropriate water and wastewater treatment technologies for developing countries</li> <li>• Hydrosphere environment such as gulfs, lakes and reservoirs by on-site monitoring of hydrodynamic flow field and water quality, eco-hydraulic computer simulation and molecular ecology</li> <li>• Hydrology, water resources and remote sensing related to meteorology, disaster prevention and climate change</li> <li>• Groundwater hydrology and geo-environment</li> </ul>