Student application guidelines

2025

Enrollment in October 2024 / April 2025
[Special Admission Examination for International Students]

Graduate School of Science and Engineering

Science and Engineering (Doctoral Course)

- Mathematical Informatics and Data Science Program
- Life, Material and Energy Sciences Program
- Sustainable Global Environmental Studies Program
- Advanced Engineering Program

July 2024

University of Toyama

In the event of an unexpected situation, the contents of the student application guidelines, including the examination schedule, may be changed. If it is necessary to make such changes, we will inform you on our website, and please be sure to check the latest information.
https://www.u-toyama.ac.jp

Admission Policy for the Doctoral Program of the Graduate School of Science and Engineering.

Admission Policy

The doctoral programs of the Graduate School of Science and Engineering at University of Toyama seek the following types of candidates for each program.

< Mathematical Informatics and Data Science Program >

We seek students who are motivated to become highly specialized professionals and researchers in mathematical informatics who can lead technological innovation in terms of mathematics, informatics, and data science, and contribute to improving the well-being of people in the region.

< Life, Material and Energy Sciences Program >

We seek students who have a strong interest and basic ability to understand and innovate in the fields of life, materials, and energy from a physical and chemical perspective across the fields of science and engineering, and who are motivated to become engineers and researchers who can contribute to the welfare of humanity by utilizing their specialized knowledge and skills to lead technological innovation and contribute to the advancement of culture in the future. We seek students who are motivated to become engineers and researchers who can contribute to the welfare of mankind by utilizing their expertise and technology to lead technological innovation and contribute to the advancement of culture.

< Sustainable Global Environmental Studies Program >

We seek students who have a strong interest and basic skills in the fields of earth science, biological science, and environmental science, and who are motivated to become engineers and researchers who can contribute to a sustainable society and human welfare by leading technological innovation and contributing to the advancement of culture by utilizing their specialized knowledge and skills.

< Advanced Engineering Program >

We seek students who have a strong interest and basic abilities in the engineering fields of mechanical engineering, electronics, robotics, materials science, and social infrastructure engineering, and who are motivated to become engineers and researchers who can contribute to the welfare of humanity by leading technological innovation and contributing to the advancement of culture through their expertise and technology.

Basic Policy for Admission Selection (Type of Entrance Examination and its Evaluation Method)

< Special Admission Examination for International Students >

Applicants will be evaluated through an oral examination, an interview, and document review to assess their language proficiency necessary for pursuing education in the doctoral program, relevant subjects of their chosen field of research, and their master's thesis and the post-admission research plan.

Qualities and abilities we are looking for

< Fundamental Competencies >

The student should have a desire to acquire a broad knowledge of a wide range of academic fields with a focus on science and engineering, as well as the basic academic skills required for completion of a master's degree program, including the ability to comprehend, think logically, and express him/herself.

< Expertise >

Have a deep interest in the field of science and engineering and have the desire to acquire specialized knowledge and applied skills through specialized research to play an active role in society.

< Ethics >

Have a sense of responsibility and ethics as a member of society and be willing to contribute to the sound development of science and technology through independent research.

< Creativity >

They have acquired a strong desire for research and flexible thinking skills to challenge unknown and cutting-edge problems in order to contribute to the local and international communities.

Table of Contents

Admission Overview of the Graduate School of Science and Engineering (Doctoral Course)

Number of students to be admitted in October 2024

Program name	Number of students to be admitted
	Special Admission Examination for International Students
Mathematical Informatics and Data Science	A few
Life, Material and Energy Sciences	A few
Sustainable Global Environmental Studies	A few
Advanced Engineering	A few

Number of students to be admitted in April 2025

Program name	Number of students to be admitted
	Special Admission Examination for International Students
Mathematical Informatics and Data Science	A few
Life, Material and Energy Sciences	A few
Sustainable Global Environmental Studies	A few
Advanced Engineering	A few

Schedules related to admission examination

Items	Enrollment in October 2024 and Enrollment in April 2025[The first recruitment] Special Admission Examination for International Students	Enrollment in April 2025[The second recruitment] Special Admission Examination for International Students (Scheduled)
Deadline for inquiry about Examination of Eligibility for Application (Only for relevant applicants)	Thursday, July 4, 2024	Friday, December 6, 2024
Notification of the examination results of eligibility for application (Only for relevant applicants)	By Thursday, July 11, 2024	By Friday, December 13, 2024
Application Period	Friday, July 12 to Friday, July 19, 2024	Monday, December 16 to Friday, December 20, 2024
Issue of Examination Ticket	Wednesday, August 7, 2024 (Scheduled)	Friday, February 14, 2025 (Scheduled)
Examination date	Thursday, August 22, 2024	Thursday, February 27, 2025
Announcement of successful applicants	Tuesday, September 3, 2024	Friday, March 7, 2025
Admission Procedure (Deadline date)	(Enrollment in October 2024) Friday, September 13, 2024 (Scheduled) (Enrollment in April 2025) Wednesday, March 5, 2025 (Scheduled)	Friday, March 14, 2025 (Scheduled)

(Note) The second recruitment may not be conducted depending on whether the first recruitment is filled. Whether or not it will be held will be announced on the university website around October 2024.
https://www.gsse.u-toyama.ac.jp/

Special Admission Examination for International Students

(Enrollment in October 2024)

1. Number of students to be admitted

Program name	Number of students to be admitted
Mathematical Informatics and Data Science Program	A few
Life, Material and Energy Sciences Program	A few
Sustainable Global Environmental Studies Program	A few
Advanced Engineering Program	A few

(Note) Applicants are required to consult with the faculty advisor of the program/educational field they wish to pursue in advance regarding the direction of their education/research, etc.

2. Eligibility for application

・A person who does not have Japanese citizenship

・A person who is qualified to stay in Japan for "Student" specified by the "the Immigration-Control and Refugee-Recognition Act" or a person who is expected to be able to change or obtain the qualification to stay in Japan for "Student" after being admitted to the Graduate School.

A person who meets the above requirements and corresponds to one of the following requirements

(1) A person who has a Master's degree or a professional degree (referring to a professional degree specified by Article 5-2 of Rules for Academic Degrees (No. 9 Ministerial Order from the Ministry of Education in 1953) based on the regulations specified in Article 104, Paragraph 1 of the School Education Act, hereinafter, the same) and a person who is expected to receive the degree by September 2024.

(2) A person who has received a degree equivalent to a Master's degree or professional degree in other countries and a person who is expected to receive the degree by September 2024.

(3) A person who has taken courses of correspondence education offered by a school in other countries or in Japan and received a degree equivalent to a Master's degree or professional degree and a person who is expected to receive the degree by September 2024.

(4) A person who has completed the courses of an educational institution that is positioned in Japan as a school that offers courses for a foreign graduate school in the school education system of that country and is designated separately by the Minister of Education, Culture, Sports, Science and Technology and received a degree equivalent to a Master's degree or professional degree and a person who is expected to receive the degree by September 2024.

(5) A person who holds or expects to obtain a Master's degree or equivalent by the end of September 2024, through course completion at the United Nations University (hereinafter referred to as UNU) as prescribe in Article 1 paragraph 2 of the Act on Special Measures Incidental to Enforcement of the Agreement between the United Nations and Japan regarding the Headquarters of the United Nations University (Act No.72 of 1976), which was established under the December 11, 1972 resolution of the General Assembly of the United Nations.

(6) A person who has been recognized by the Graduate School of Science and Engineering as having academic ability equal to or higher than that of a person holding a master's degree after having completed required course at the United Nations University or an educational institution in a foreign country described in (4) and passed the examination or the equivalent examination that was prescribed in Article 16 paragraph 2 of the Rules on Graduate Schools.

(Note) For persons wishing to submit an application according to Applications Requirements (6), please enquire in advance to Admission Office (Educational Affairs Division) of the school of Engineering and submit all application documents required by the University of Toyama.

(7) A person who is designated by the Minister of Education, Culture, Sports, Science and Technology (Notification No. 118 of the Ministry of Education in 1989).

(8) A person who was recognized by the Graduate School of Science and Engineering to have the ability equal to or surpassing a person with a Master's or professional degree through the individual examination for admission qualification, and will be at least 24 years old by the time of admission.

(Note) As for certification of the eligibilities (7) and (8) for application, please see "(4) Filing for certification of eligibility for application" of "5. Application Procedures".

3. Selection methods

Students eligible to enroll are selected based on the results of the oral examination, interview and submitted documents. The examinees need not take a paper test.

(1) Oral examination and interview

The oral examination is about subjects related to the student's preferred education field, Master's thesis, research plan after admission, etc.

(2) Date of examination (oral examination and interview)

Date	Subjects for Examination, etc.	Time	Site for Examination
August 22 (Thursday), 2024	Arrival time	13:00	School of Science/ Engineering, University of Toyama (Gofuku Campus)
	Oral Examination and interview	13:30 ~	

* The location of the place of examination will be notified when the examination ticket is issued.
* For those who reside overseas and have difficulty coming to University of Toyama due to unavoidable circumstances, it is possible to take the examination online.

Special Admission Examination for International Students

(Enrollment in April 2025)

1. Number of students to be admitted

Program name	Number of students to be admitted
Mathematical Informatics and Data Science Program	A few
Life, Material and Energy Sciences Program	A few
Sustainable Global Environmental Studies Program	A few
Advanced Engineering Program	A few

(Note) Applicants are required to consult with the faculty advisor of the program/educational field they wish to pursue in advance regarding the direction of their education/research, etc.

2. Eligibility for application

・A person who does not have Japanese citizenship

・A person who is qualified to stay in Japan for "Student" specified by the "the Immigration-Control and Refugee-Recognition Act" or a person who is expected to be able to change or obtain the qualification to stay in Japan for "Student" after being admitted to the Graduate School.

A person who meets the above requirements and corresponds to one of the following requirements

(1) A person who has a Master's degree or a professional degree (referring to a professional degree specified by Article 5-2 of Rules for Academic Degrees (No. 9 Ministerial Order from the Ministry of Education in 1953) based on the regulations specified in Article 104, Paragraph 1 of the School Education Act, hereinafter, the same) and a person who is expected to receive the degree by March 2025.

(2) A person who has received a degree equivalent to a Master's degree or professional degree in other countries and a person who is expected to receive the degree by March 2025.

(3) A person who has taken courses of correspondence education offered by a school in other countries or in Japan and received a degree equivalent to a Master's degree or professional degree and a person who is expected to receive the degree by March 2025.

(4) A person who has completed the courses of an educational institution that is positioned in Japan as a school that offers courses for a foreign graduate school in the school education system of that country and is designated separately by the Minister of Education, Culture, Sports, Science and Technology and received a degree equivalent to a Master's degree or professional degree and a person who is expected to receive the degree by March 2025.

(5) A person who holds or expects to obtain a Master's degree or equivalent by the end of March 2025, through course completion at the United Nations University (hereinafter referred to as UNU) as prescribe in Article 1 paragraph 2 of the Act on Special Measures Incidental to Enforcement of the Agreement between the United Nations and Japan regarding the Headquarters of the United Nations University (Act No.72 of 1976), which was established under the December 11, 1972 resolution of the General Assembly of the United Nations.

(6) A person who has been recognized by the Graduate School of Science and Engineering as having academic ability equal to or higher than that of a person holding a master's degree after having completed required course at the United Nations University or an educational institution in a foreign country described in (4) and passed the examination or the equivalent examination that was prescribed in Article 16 paragraph 2 of the Rules on Graduate Schools.

(Note) For persons wishing to submit an application according to Applications Requirements (6), please enquire in advance to Admission Office (Educational Affairs Division) of the school of Engineering and submit all application documents required by the University of Toyama.

(7) A person who is designated by the Minister of Education, Culture, Sports, Science and Technology (Notification No. 118 of the Ministry of Education in 1989).

(8) A person who was recognized by the Graduate School of Science and Engineering to have the ability equal to or surpassing a person with a Master's or professional degree through the individual examination for admission qualification, and will be at least 24 years old by the time of admission.

(Note) As for certification of the eligibilities (7) and (8) for application, please see "(4) Filing for certification of eligibility for application" of "5. Application Procedures".

3. Selection methods

Students eligible to enroll are selected based on the results of the oral examination, interview and submitted documents. The examinees need not take a paper test.

(1) Oral examination and interview

The oral examination is about subjects related to the student's preferred education field, Master's thesis, research plan after admission, etc.

(2) Date of examination (oral examination and interview)

The first recruitment

Date	Subjects for Examination, etc.	Time	Site for Examination
August 22 (Thursday), 2024	Arrival time	13:00	School of Science/ Engineering, University of Toyama (Gofuku Campus)
	Oral Examination and interview	13:30 ~	

* The location of the place of examination will be notified when the examination ticket is issued.
* For those who reside overseas and have difficulty coming to University of Toyama due to unavoidable circumstances, it is possible to take the examination online.

The second recruitment

Date	Subjects for Examination, etc.	Time	Site for Examination
February 27 (Thursday), 2025	Arrival time	13:00	School of Science/ Engineering, University of Toyama (Gofuku Campus)
	Oral Examination and interview	13:30 ~	

* The second recruitment may not be conducted depending on whether the first recruitment is filled. Whether or not it will be held will be announced on the university website around October 2024.
* The location of the place of examination will be notified when the examination ticket is issued.
* For those who reside overseas and have difficulty coming to University of Toyama due to unavoidable circumstances, it is possible to take the examination online.

General Procedure of Application and Admission

1. Application Period

Test category	Application period
(First recruitment including admission in October 2024) Special Admission Examination for International Students	Friday, July 12, 2024 Friday, July 19, at 16:00
(Second recruitment) Special Admission Examination for International Students	Monday, December 16, 2024 to Friday, December 20 at 16:00

All documents required for application must be sent by registered express mail (EMS or other traceable means if mailing from abroad) so that they arrive no later than the application period. Applications cannot be submitted in person. Please mail in plenty of time considering the postal situation.

Please note that applications arriving after the application period will not be accepted. However, application documents will be accepted even if they reach the University after the expiration of the application period on condition that they are delivered by registered express mail with a postmark with the date of the day before the application deadline or before (only a postmark put in Japan is acceptable).

Please note that the University will not respond to inquiries as to whether or not the application envelopes sent to the applicant have arrived at the University (or have been delivered). Please confirm the arrival of the application envelopes by using the tracking services of the respective companies by his /herself.

2. Application Procedures

Applications must be submitted online only. The application procedure is completed by sending the required documents by registered express mail within the application period after the registration and payment of the application fee on the Internet application site.

Please read the following "Online Application Procedure" carefully and follow the instructions.

Online Application Procedure

STEP 1 Access the online application website
STEP 2 Create an account on My Page
STEP 3 Register the contents of your application
STEP 4 Pay the entrance examination fee
STEP 5 Printing required documents
STEP 6 Mailing application documents

Prepare → Application completed → Print your admission ticket

Prepare

see page 11

Prepare a PC with an Internet connection and a printer, etc.
It may take time for the required documents* to be issued. Please start preparing them early and ensure that you have them with you before applying.

*Required Documents : An official transcript, data of your photo, etc.

Access the Online Application Website

Access from the Online Application website ▶ **https://e-apply.jp/ds/toyama-gs/**

or

the University website ▶ **https://www.u-toyama.ac.jp/**

After completing registration on the Internet application site (STEP 2), the application is completed by paying the examination fee (STEP 3), printing and mailing the required documents (STEP 4, STEP 5).
Please note that your application is not complete just by registering.
Online applications are available 24 hours a day.
However, application documents must arrive by 16:00 on the last day of the application period.
Please make sure to give yourself plenty of time when applying.

STEP 1

Create an Account on My Page

Enter the required information according to the instructions on the screen to create an account on My Page.
If you have already registered on My Page, proceed to STEP 2.

① If you are registering for the first time, click
My Page Registration

② Register your e-mail address and click on
Send an e-mail for temporary registration >

③ Click on the
To the log-in page from the user registration screen.

④ A default password and a registration URL will be sent to your registered e-mail address.

*Configure your e-mail settings to receive e-mails from the @e-apply.jp domain.

⑤ From the log-in screen, use your registered e-mail address and the default password you received in ④ and click
log-in

⑥ Change your default password.

⑦ Enter your personal information and click
Next

⑧ Confirm your personal information and click
Register this information

⑨ Registration is complete. Click **To My Page**

⑩ When the above page appears, My Page registration is complete.

*You can proceed to the application procedures by clicking on the **Apply** button only while applications are being accepted.
You cannot proceed from here onward during times outside the period.
Click on the Log-out button.

STEP 2

Register the Contents of Your Application

Make sure to check the procedures and important notices on the screen, and then enter the required fields according to the instructions on the screen.

① After logging in to My Page, click on the **Apply** button, and the registration page will appear.

② Select an entrance exam and confirm the important notices.

③ Select the desired department, etc.

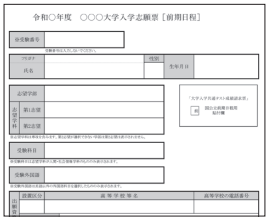
④ Upload a photo.
Click on the Select Photo button to select a photo.

⑤ Enter your information entrance (name, address, etc.).

⑥ Confirm the contents of your application.
Click on the Application Form (sample) button to check your application form.

⑦ Your application is registered.
Click on the **Pay** button to proceed to the page where you can pay your entrance examination fee.

⑧ Payment methods for examination fees.
- Convenience stores
- ATMs with Pay-easy
- Online banking
- Credit cards



⑨ Document required for the application in PDF format (Sample)
***This document can be printed out after the entrance examination fee is paid.**

If you have selected "Convenience Stores" or "ATMs with Pay-easy" as your payment method, write down the payment number, which will appear after the selection of a payment method, in the memo space below, and make the payment at a convenience store or an ATM with Pay-easy within the designated payment deadline.

For 7-ELEVEN

Payment slip number Memo (13 digits)	

For Daily YAMAZAKI, Seicomart

Online payment number by Memo (11 digits)	

For LAWSON, MINISTOP, FamilyMart, ATMs with Pay-easy

Customer number memo (11 digits)	
Confirmation number memo (6 digits)	
Receiving agency number (5 digits)	5 8 0 2 1

*A receiving agency number is required for payment Pay-easy.

A confirmation e-mail will be sent to you after the application registration is completed. If you have restricted the reception of e-mails, please allow e-mails from the sender (@e-apply.jp) to be received. *Please note that confirmation e-mails may be sorted into your junk e-mail folder, etc.

Please be careful not to enter incorrect information, as the registered information cannot be changed or modified after the application registration is completed. However, if you have not yet paid the entrance examination fee, you can substantially modify the information by re-registering using the correct information.

*Please note that if you have selected a credit card for the "Payment Method for the Entrance Examination Fee," the payment will be completed simultaneously with the registration for application.

STEP 3

Pay the Entrance Examination Fee

1 Credit Card Payment

You can select this method and make a payment when registering your application.

【Accepted Credit Cards】
VISA, Master, JCB, AMERICAN EXPRESS, MUFG Card, DC Card, UFJ Card, NICOS Card

Payment is completed upon registration.

2 Online Banking Payment

After registering your application, you will be redirected to the page of each financial institution from the current page. Please follow the instructions on the screen to make the payment.

*For online payment, your bank account must be signed up for internet banking.

The procedures are completed online.

3 Convenience Store Payment

Payment at a convenience store can be made using the payment number that will appear after you have registered the application information.

- Payment can be made at a cash register.
- Payment can be made using a store terminal.

Loppi

Multi-functional copy machine

4 Bank ATMs with Pay-easy

Payment can be made using the payment number that will appear after you have registered the application information at bank ATMs with Pay-easy by following the instructions on the ATM screen.

*Please check the "Payment Method Selection" screen to see the banks that offer this payment method.

Enter the required information following the instructions on the screen of each convenience store terminal or ATM and confirm the details before paying the entrance examination fee.

3 Convenience Stores

7-ELEVEN

Store cash register

Tell the cashier that you want to make an "Internet Payment"

Tell the cashier the "payment slip number" (13 digits).

Pay the entrance examination fee at the cash register.

Be sure to receive the receipt (receipt slip form).

Daily YAMAZAKI / YAMAZAKI DAILY STORE

Store cash register

Tell the cashier that you want to make an "Online Payment".

Tell the cashier the "online payment number" (11 digits).

Pay the entrance examination fee at the cash register.

Be sure to receive the receipt (receipt slip form).

LAWSON / MINISTOP

Loppi

Select "Those who have a number".

Enter the "customer number (11 digits)".

Select the "multi-payment service".

Enter the "confirmation number (6 digits)".

Confirm the payment information.

Bring the printed application ticket (acceptance slip) to the cash register to pay the examination fee in cash. Please pay at the cash register within 30 minutes after the application ticket (acceptance slip) is printed.

Be sure to receive the statement and receipt.

FamilyMart

Multi-functional copy machine

Select "Payment/Charge (Convenience Store Payment/Charge)".

Enter the "customer number (11 digits)".

Enter the "confirmation number (6 digits)".

Confirm the payment information.

Bring the printed application ticket (acceptance slip) to the cash register to pay the examination fee in cash. Please pay at the cash register within 30 minutes after the application ticket (acceptance slip) is printed.

Be sure to receive the statement and receipt.

Seicomart

Store cash register

Tell the cashier that you want to make an "Internet Payment"

Tell the cashier the "online payment number" (11 digits).

Pay the entrance examination fee at the cash register.

Be sure to receive the receipt (receipt slip form).

4 Bank ATMs

ATMs with Pay-easy

ATMS with Pay-easy

Select "Tax and Fee Payment,". etc.

Enter the receiving agency number "58021".

Enter the "customer number (11 digits)".

Enter the "confirmation number (6 digits)".

Confirm the payment information.

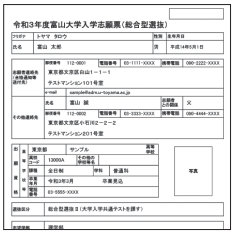
Select "Cash" and "Cash Card" and pay the entrance examination fee.

Be sure to receive the statement.

STEP 4

Printing required documents

Please log in from the "Confirm Application/Print Application Form" button and print the application form and other required documents in color on A4 paper.



Application form PDF (image)

STEP 5

Mailing application documents

Please note that your application is not complete just by registering.

Please send the documents required for the application by "**Registered express mail**" from the post office window during the application period.

■ Application Documents

One copy is required for each application registration.

Please refer to pages 12 to 13 of the university's application guidelines to prepare the documents required for application.

<Deadline for submission of application documents>

See page 6

The mailing address for the application documents is automatically printed on the address sheet.

Paste the address sheet on a commercially available square No. 2 envelope (240mm x 332mm)please.

Once received, the application fee and application documents will not be returned except for reasons specified in the application guidelines.

< Application completed >

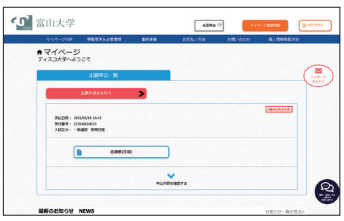
We will not respond to any inquiries regarding acceptance by telephone or other means.

STEP 6

Print your admission ticket

see page 14

You will be able to print your admission ticket from the online application site after the date of issuance of your admission ticket. Please log in from the "Print Examination Ticket" button and print it. Be sure to print the admission ticket in color on A4 paper and bring it with you on the day of the examination.



(1) Advance preparation

Documents, etc.	summary
Recommended System Environments	Use the following Web browser for Internet filing: ・Microsoft Edge Latest edition ・Google Chrome Latest edition ・Mozilla Firefox Latest edition ・Apple Safari Latest edition * If you would use a tab function of a browser to simultaneously carry out an application operation using more than one tab, there may be the case of malfunction, such as, selected contents are taken over to other tabs. Please refrain from simultaneously carrying out the application operation using more than one tab. If you want to go back to the previous screen, please use the "Return" button displayed on the screen instead of the "Back" button of your browser. * Mobile devices such as smartphones and tablets can be viewed, but since it is not a recommended environment, it may not be displayed properly from some terminal screens. In addition, a printing function is required, so please use a computer.
Software needed for downloading or printing PDF files	Adobe Reader is necessary to view or print the application form that is in a PDF format. Please download the Adobe Reader software from the following website (free download).
E-mail Address	A valid email address is required for your application. Please be ready to provide your email address when you start your online registration for application. If you have registered an e-mail address issued by a smartphone or mobile phone carrier, please follow your carrier's spam filtering instructions and set your e-mail address so that you can receive e-mails from @e-apply.jp.
Personal photo	Face photo data by the applicant in the application (jpeg, jpg, png, bmp) is required. In the upper body, no hat, front-facing, Please prepare a clear photograph taken within 3 months prior to submission. File will be up to 10MB. It should be noted that, if it is determined that it is not suitable as application photos, there is a case to be re-submitted.
Printer	In order to output the application form and examination admission ticket (PDF), print on A4 plain paper. You need a color printer that can be used with printing paper (plain paper, PPC paper, OA common paper, copy paper, etc.). Please to mind.
Square 2 envelope	Use a commercially available No. 2 square envelope (240 mm x 332 mm). Please use the "address sheet" that is output when you print the admission application form and paste it on the envelope.

(2) Examination fee

30,000 yen.

Payment of the application fee will be made after completion of the registration of application details in STEP 2 on page 8 . Please apply through the university's "Internet Application Site (https://e-apply.jp/ds/toyama-gs/)" and pay the application fee after completing the applicant registration. Please confirm the method of payment of the examination fee by referring to STEP 3, Payment of the Examination Fee, on page 9. After paying the application fee, you will be able to print out the application form.

A separate handling fee is required for payment of the examination fee. The fee is to be paid by the payer.

In addition, there is a system of exemption from the examination fee for those affected by disasters. For more information, please refer to the University's website.

Once the examination fee has been received, it will not be refunded for any reason, except in the following cases.

[1] Cases in which a refund of the examination fee may be requested and the amount of refund.

(i) If you paid the application fee but did not apply to the University of Toyama (did not submit the application documents, etc. or your application was not accepted) [Refund amount] 30,000 yen

(ii) In case of double payment of the examination fee [Refund amount] 30,000 yen

(iii) If you have paid a large amount of the examination fee [Refund amount] The amount you have paid in excess of the examination fee

However, the recipient is responsible for the bank transfer fee when returning the loan.

[2] Method of claiming refund

Please fill out the attached "Written Claim for Return of Examination fee" and mail it to University of Toyama.

Send to: Accounting Division I of Finance and Facilities Department, University of Toyama

3190 Gofuku, Toyama City, Toyama 930-8555

Tel: 076-445-6053 (Int'l calls: +81-(0)76-445-6053)

[3] Important notes

Intramural students and government-sponsored international students are not required to pay the examination fee.

When registering on the Internet application site, be sure to check the "Application Fee Waiver" box.

For passwords, please contact the contact listed in "8. Cautions (6)" (page 16).

(3) Application documents, etc.

Applicants must send the required documents in an envelope with an "address sheet" attached by registered express mail (EMS or other traceable means if mailing from abroad). The required documents will be sent after the payment of the examination fee in STEP 3 on page 9 is completed.

① Documents to be printed from the Internet application site

Documents, etc.		
[1]	Application for admission	Please print out the application form in A4 size in color from the Internet application site. Printing is available after payment of the application fee.
[2]	Address sheet	Please print out the application form in A4 size in color from the Internet application site. Attach it to a commercially available kakugata 2 envelope (240mm x 332mm) without peeling off.
[3]	Pledge	Please print out the application in A4 size from the Internet application site. See "9 Security Export Control" on page 17.

Be sure to check the printed information for errors.

② Documents to be prepared by applicants

	Documents	Remarks
1	Certificate of (expected) completion of Master's degree * 1,2	To be prepared by the head of the university (graduate course) from which the applicant graduated. However, a person who completed (is expected to complete) an education department/graduate course of the Graduate School of University of Toyama is not required to submit this document.

2	Certificate of grade report of graduate school [*1,2]	To be prepared and strictly sealed by the head or dean of the education department (graduate school head) of the university from which the applicant graduated. The certificate using forgery copy prevention paper is not required to be strictly sealed.
3	Certificate of grade report of undergraduate school [*1,2]	To be prepared and strictly sealed by the head or dean of the university from which the applicant graduated. The certificate using forgery copy prevention paper is not required to be strictly sealed.
4	Research plan	Please use the form designated by the University and fill out a research plan for this School for Education in the form.
5	Copy and abstract of dissertation for Master's degree [*1]	One copy of the dissertation and its abstract. However, for a person who has not yet graduated, please describe the progress of the dissertation (within 2,000 characters in Japanese or 1,000 words in English in the designated form). If the applicant has a separate print of a related dissertation, academic lecture, patent, etc., please attach a copy.
6	Certificate of approval for taking examination	Please choose a form. For a person who is enrolled in the Ph.D. program of another university or a person working in a public off ice or company, please attach a certificate of approval for taking an examination issued by the head of the education school (graduate course) of that university or the head of the division to which the applicant belongs.
7	Copy of the certificate of residence	For a foreigner who now lives in Japan, please attach a copy of the certificate of residence issued by the head of municipal government or a copy of both sides of the residence card.

[*1] A person who corresponds to (7) or (8) eligibility for application and does not have a Master's or Bachelor's degree, the submission of "certificate of completion of Master's degree," "certificate of grade report of graduate school," "certificate of grade report of undergraduate school" and "copy and abstract of dissertation for Master's degree" is not necessary.

[*2] Documents written in a foreign language other than English must be accompanied by documents translated into Japanese or English.

(4) Filing for certification of eligibility for application

① The scope specified in the "Eligibility for Application (7)" is a person who meets the following requirements: (a) and (e) or (b) and (e).

② The scope specified in the "Eligibility for Application (8)" is a person who meets the following requirements: (c) and (e) or (d) and (e).

(a) A person who has the experience of being engaged in research at a university, research institute, etc. for two years or more after graduating from university.

(b) A person who has the experience of being engaged in research at a university, research institute, etc. for two years or more after completing 16-years of courses in school education in a foreign country or after completing 16-years of courses in school education in a foreign country by taking courses in Japan through correspondence education offered by a school in that country.

(c) A person who graduated from a junior (two-year) college, technical college (specialized vocational high school), special vocational school and other types of school or who has completed a Japanese school of a foreign university, etc. and does not have a Master's degree, but has the experience of being engaged in research at a university, research institute, etc. or who has working experience in a science or technology- related field for two years or more and will be at least 24 years old by the time of admission.

(d) A person who has working experience in a science or technology-related field for two years or more after graduating from university.

(e)A person who has a research achievement such as his or her book, scientific paper, scientific lecture, scientific report, patent, etc. that is recognized to have the same or more value as the dissertation for a Master's degree.

③ A person who applies based on the "Eligibility for Application (7) or (8)" is subject to preliminary review for eligibility. Please gather the following documents and submit them to the Admission Office (Educational Affairs Division) of School of Engineering of University of Toyama by the deadline. When the documents are mailed, they must be received by the above deadline.

◎Deadline for submission

[First recruitment including admission in October 2024] Thursday, July 4, 2024, at 16:00

[Second recruitment] Friday, December 6, 2024, at 16:00

◎Documents to be submitted

- Graduate certificate
- Grade report from the applicant's highest level of schooling
  (prepared and strictly sealed by the head or dean of the school from which the applicant graduated)
- Review report for certification of eligibility for application for admission examination
  (The University of Toyama's designated form)
- Research and working report of achievement (The University of Toyama's designated form)
- Separate copies of research/scientific papers, etc.

◎Notification of screening results

[First recruitment including admission in October 2024] Thursday, July 11, 2024

[Second recruitment] Friday, December 13, 2024

A person who is certified must complete the application procedures within the designated period.

(5) Preliminary consultation for a physically-handicapped applicant

Because a physically-handicapped applicant may need special consideration when taking an examination or attending the university, please consult the Admission Off ice (Educational Affairs Division) of the School of Engineering of the university prior to the application.

During the consultation, we may ask for the submission of a document describing the following matters and a doctor's certificate.

- Type and severity of disability
- Matters for which the applicant requests special consideration when taking an exam
- Matters for which the applicant requests special consideration when attending the university
- Situation of daily living and other matters that can be referred to

① Deadline for consultation:

[First recruitment including admission in October 2024] Thursday, June 27, 2024, at 16:00

[Second recruitment] Friday, December 6, 2024, at 16:00

② Contact: Admission Office (Educational Affairs Division) of the School of Engineering

University of Toyama
3190 Gofuku, Toyama City, Toyama 930-8555, Japan
Tel: 076-445-6399 (Int'l calls: +81-(0)76-445-6399)

3. Printing out the Examination Ticket and instructions for the examination

(1) The examination ticket will be available for printing on the Internet application site after the date of issuance of the ticket after the University receives the application documents sent by the applicant. When the examination voucher is ready to be printed, we will notify the applicant's e-mail address registered at the time of Internet application.

(Note) The date of issuance of examination ticket is tentative and may be subject to change.

(2) Log in to My Page from "Login" on the Internet application site. In order to log in, you will need [your email address and the password you set yourself].

(3) After log in, please download the examination ticket. Please print out the examination ticket in color on A4 paper and bring it with you on the day of the examination. Please be sure to read the "Precautions for the Examination" printed with the examination ticket. Please be sure to read them carefully before taking the examination.

Precautions

(1) After printing the examination ticket, be sure to check the information on it. If the information is different from what you registered for the application, please contact Admission Office (Educational Affairs Division) of the School of Engineering as soon as possible.

Also, be sure to check that the examination number on the computer screen and the number on the printed examination ticket match.

(2) Even if you do not receive an e-mail, please log in to the Internet application site and print out the examination voucher and instructions for the examination.

(3) The number you receive when you register your application online is not your examination number. Please be sure to bring your examination ticket with you on the day of the examination, as you will not be allowed to take the examination using your reception number.

(4) On the day of the examination, it is not acceptable to present the examination ticket by displaying it on the screen of a smartphone or other such device. Be sure to bring the printed examination ticket and keep it in a safe place after the examination.

4.Announcement of successful applicants

At the time of the day shown below, the examinee number of each successful applicant will be posted on the website of the University of Toyama, and a Letter of Acceptance will be mailed to each successful applicant.

We will not respond to any inquiries by telephone or other means.

Test category	Date of announcement
(First recruitment including admission in October 2024) Special Admission Examination for International Students	15:00 on Tuesday, September 3, 2024
(Second recruitment) Special Admission Examination for International Students	15:00 on Friday, March 7, 2025

5.Admission procedures

The admission procedures shall be as follows, but the successful applicants will be notified of the details individually.

(1) Deadline for admission procedures

Test category	Admission procedure starting date
(October 2024 Enrollment) Special Admission Examination for International Students	Friday, September 13, 2024 (Scheduled)
(First recruitment) Special Admission Examination for International Students	Wednesday, March 5, 2025 (Scheduled)
(Second recruitment) Special Admission Examination for International Students	Friday, March 14, 2025 (Scheduled)

(2) Expenses required for admission procedures

① Enrollment fee: 282,000 Japanese yen (subject to change)
However, if you have completed a master's course at one of the graduate schools of the University of Toyama and wish to continue to a doctoral course at the Graduate School, you do not need to pay the admission fee.
The above enrollment fee is the scheduled amount. If the enrollment fee is revised at the time of admission, a new enrollment fee will be applicable from the time of revision.

② Other expenses such as disaster and injury insurance for students, and education and research fees will be required separately.

(Notes)

1. The tuition may be paid after admission. The exact amount of the fees and detailed method of payment will be explained at the time of the admission procedures. The tuition of academic year 2024 was 535,800 Japanese yen.
2. The paid enrollment fee can not be refunded for any reason.
3. If he or she has difficulty arranging the payment of the enrollment fee and tuition, the successful applicant may be exempted or his/her payment postponed.

(3) Caution

If a person does not complete the admission procedures by the deadlines, he or she will be considered to have withdrawn from admission.

6.Protection of personal information of an applicant for admission

The personal information possessed by the University shall be handled based on the “Act on the Protection of Personal Information.” and “University of Toyama Rules for Protection of Personal Information.”

(1) The names, addresses and other personal information of applicants learned at the time of application shall be used for ① selection of students to be enrolled (application processing, implementation of selection), ② announcement of successful applicants, ③ admission procedures, ④ survey/study in the selection method of enrolled students, and ⑤ operations associated with these purposes.

(2) Among the personal information learned at the time of application, only the information of those who completed the procedures for admission to our university shall be used for post-admission operations related to ① educational instruction (school registry, attending instruction, etc.), ② student support (health management, application for tuition waiver/scholarship, career support, etc.), ③ collection of tuition, and ④ statistical survey and data analysis.

(3) Only the applicant ID numbers, names and addresses of successful applicants may be used for contact with the organizations associated with the university, alumni association and co-op. Note: If a successful applicant does not wish to have any contact with the above organizations, please inform the Admission Off ice (Educational Affairs Division) of the School of Engineering to that effect.

(4) In the use of personal information for various types of operations, some of the operations may be conducted by a vendor contracted with the relevant operations from our university (hereinafter referred to as “contractor”). When contracting the operations, all or part of the personal information learned shall be provided to the contractor within the limit necessary to perform the contracted operations. We supervise the use of information to ensure compliance with confidentiality.

7.Long-term curriculum program

A long-term curriculum program is a program intended for those who cannot complete the curriculum under the standard course term because the curriculum hours for classes and research instruction are limited due to reasons such as they are working (full-time) and they intend to complete educational courses in a planned manner during a certain period longer than the standard course term. In our Ph.D. program, the student's school days are accepted up to a total of 6 years. If permitted at the time of admission, the total amount of tuition to be paid in the standard course term (3 years) can be paid evenly for each school term during the period accepted as a long-term curriculum period.

* Details, including the method of application for this program, shall be notified to applicants when the documents for admission procedures are sent.

* Please note that not every applicant is necessarily permitted to enter this program.

8. Cautions

(1) If there are any defects in the application documents, the application may not be accepted.

(2) If there is a shortage in the entrance examination fee payment, the application shall not be accepted.

(3) The use of generative AI such as ChatGPT in documents prepared by applicants is prohibited.

(4) The application documents, etc. once accepted shall not be returned for any reason.

(5) If any fact that is different from the description in the submitted documents is found, even after acceptance of admission, the admission of a successful applicant may be cancelled.

(6) Please forward any inquiry about the application or other matters to the following address.

Admission Off ice (Educational Affairs Division) of the School of Engineering University of Toyama

3190 Gofuku, Toyama City, Toyama 930-8555, Japan

Tel: 076-445-6399 (Int'l calls:+81-(0)76-445-6399)

9.Security Export Control

University of Toyama has established the "University of Toyama Security Export Control Regulations" based on the "Foreign Exchange and Foreign Trade Act", and conducts strict screening for security export control in the perspective of providing technology and export of research equipment and materials. If applicants who fall under any of the regulated items, you may not be able to get the permission to enroll, and receive the desired education at the university. There may be restrictions on your desired research activities.

For more information, please visit the University website.
[Reference] "University of Toyama Security Export Control Regulations" URL
http://www3.u-toyama.ac.jp/soumu/kisoku/pdf/0110401.pdf

Enrollment in October 2024

Guide of Graduate School of Science and Engineering (Doctoral Course)

The Doctoral Program in Science and Engineering of Graduate School of Science and Engineering consists of four programs: Mathematical Informatics and Data Science Program, Life, Material and Energy Sciences Program, Sustainable Global Environmental Studies Program, and Advanced Engineering Program. The overview of each program is as follows.

(1) Mathematical Informatics and Data Science Program

In today's rapidly advancing information society, there is a need for further improvement of the environment to cope with an aging society and to enable people in general to live safely and comfortably.
In this program, we aim to train advanced professionals and researchers who can foresee further advancements in the informatized society and equip themselves with a solid foundation in mathematics, information science, and data science. They will gain comprehensive knowledge in mathematical informatics, critical thinking skills, and problem-solving abilities, allowing them to play important roles in the increasingly informatized society of the future.

Educational field	Education and Research	Supervisors	Related lectures
Basic computer engineering	We conduct education and research on software development for practical use of computers, analysis and development of algorithms for useful software and advanced signal processing analysis in computer systems.	Prof. Shigeki Hirobayashi Associate Prof. Tadanobu Misawa Lecturer Takuma Watanabe	Advanced signal processing Advanced machine learning Microwave Sensing
Bio-medical informatics	We conduct education and research on visual information processing engineering, emotional information processing engineering, sensing and imaging technologies, signal and image processing, pattern recognition, color engineering, evaluation and analysis of CG/3-D visible images, optical and visual environment engineering, traffic visual environment engineering, urban landscape lighting, the hot issues of development of universal design for elderly persons and people with synesthesia, visual neurophysiology, neural computing, synaptic plasticity, bioinformatics, evaluation of human cognition and social interaction and development of hardware and software for image information processing inspired by intriguing human sensory information processing mechanisms.	Prof. Hideyuki Hasegawa Prof. Takashi Katagiri Prof. Toshihide Tabata Associate Prof. Mamoru Takamatsu Associate Prof. Yusuke Oshima Associate Prof. Ryo Nagaoka Assistant Prof. Masaaki Omura	Advanced Medical Ultrasonics Advanced Bio-medical Optics Advanced biological information processing Advanced kansei information processing Advanced clinical informatics engineering Advanced medical ultrasonic measurement Advanced Medical Ultrasonics
Human Informatics	We conduct education and research on the analysis and evaluation of human cognition and social interaction, and on the design of information technologies that support people's intellectual activities in real life. For this purpose, we employ a combination of multimodal measurement of brain, psychological, physiological, and behavioral activities with data science and artificial intelligence techniques.	Prof. Takayuki Nozawa Associate Prof. Shigeki Ikeda	Advanced Cognitive Interaction Brain Information Engineering
Artificial intelligence	We conduct education and research on the design, analysis, and evaluation of various artificial intelligent methodologies, including the artificial neural networks which are inspired by the human brain's architecture and information processing mechanisms, the deep learning which is able to learn by itself, particle swarm optimization, ant colony optimization, error back-propagation method, genetic algorithm, evolutionary strategy, and other machine learning technologies.	Prof. Shangce Gao Assistant Prof. Zhenyu Lei	Advanced computational intelligence Advanced Deep Learning

Computational Science	We conduct education and research on designing, implementing, and using mathematical models, numerical analysis, and numerical simulations to analyze and solve scientific problems.	Associate Prof. Takayuki Haruki	Advanced Computational Science
Mathematical analysis	In order to respond to the rapid development of state-of-the-art technologies such as computers and communication technologies, we actively conduct research on information mathematical science from a position to analyze the mathematical models and mathematical rules underlying them, and conduct education on representation theory, nonlinear analysis and stochastic process. We also aim to cultivate experts with the ability to analyze mathematical phenomena making full use of computers; such experts would be able to perform research and development that are necessary for running advanced information of the science and technology society.	Prof. Hiroyuki Yamane Prof. Masato Kikuchi Prof. Keiichi Ueda Associate Prof. Hideo Deguchi Associate Prof. Masakazu Akiyama	Advanced representation theory Advanced stochastic process Advanced computational mathematics Advanced mathematical phenomenal analysis Advanced mathematical sciences based on modeling and analysis
Mathematical structural science	We conduct education and research on the basic theory of mathematical science that supports the society depending on the complex and advanced science and technology, search for reliability in a comprehensive manner, and explore methods of mathematical analysis for mathematical phenomena. We also aim to cultivate specialists who excel in mathematical thinking and logic-composing by deepening their ability to analyze mathematical structures.	Prof. Keiko Fujita Prof. Takashi Koda Associate Prof. Tatsuya Kawabe Associate Prof. Iwao Kimura	Advanced complex analysis Advanced geometry Advanced theory of geometric structures Advanced number theory
Quantum information	We are working on quantum information theory where application of quantum mechanics offers revolutionary improvements to information processing. Our interest includes proposal of quantum cryptgraphic protocols and side-channel attacks against them, security analyses of quantum protocols, and analyses of quantum repeaters.	Prof. Kiyoshi Tamaki Lecturer Akihiro Mizutani	Advanced quantum informationprocessing Advanced quantum computing

（2）Life, Material and Energy Sciences Program

Our course offers a wide range of research fields including life and material chemistry, advanced clean energy, physics and applied physics which are keys to modern science and technology and indispensable for our future. Students will acquire skills and knowledge, both basic and applied, through reading academic articles, giving scientific reports, and participating in conferences and symposiums as well as communications among researchers and research fields. We are proud of producing highly innovative graduates.

Educational field	Education and Research	Supervisors	Related lectures
Neural system and cell electrical engineering	We conduct education and research on the following topics. ・Phase-dependent processing of sensory information in synchronous neural activities and dynamic interaction among the nonlinear oscillators in a brain as well as between the brain and rhythmic sensory inputs, using relatively simple invertebrate system. ・Applications to cell sensors and cell separation as a fusion field of cell engineering and electrical engineering.	Prof. Shigenori Kawahara Lecturer Minoru Suga	Advanced Lecture on Dynamics in Brain and Neural Systems Advanced Lecture on Biological Dielectric Phenomena

Molecular and cellular bioengineering	Education and research will be conducted on the development of monoclonal antibodies for diagnostic and therapeutic use, as well as on the functional analysis of biomolecules using antibodies and their application in biotechnology. Education and research will be conducted to elucidate the mechanism of protein metabolism in vivo and develop artificial regulation methods of protein metabolism. Education and research will be conducted to develop material production processes by bioreaction engineering using microorganisms and to elucidate their microbial cellular mechanisms. Education and research will be conducted to deepen our understanding of life using synthetic biology techniques, which aim to artificially build life and biological systems by reconstituting biological molecules, and apply this knowledge to various fields, such as environmental issues and advancing healthcare.	Prof. Nobuyuki Kurosawa Associate Prof. Tomonao Inobe Associate Prof. Tatsuhiko Ozawa Lecturer Maki Moriwaki Assistant Prof. Seiichi Koike	Advanced Course in Antibody Engineering Advanced Course in Protein Metabolism Advanced Course in Immune Engineering Advanced Course in Microbial Reaction Engineering Advanced Course in Synthetic Cell Biology
Pharmacology	Education and research will be conducted on intractable chronic pain diseases such as postherpetic neuralgia, migraine, and cancer pain, and intractable chronic pruritic diseases such as atopic dermatitis, in order to elucidate their pathological mechanisms and to discover novel therapeutic agents.	Associate Prof. Ichiro Takasaki	Advanced Pharmacology and Genetic Engineering
Medicinal Chemistry	Research and education on drug discovery research, including synthetic studies of natural products exhibiting unique biological activities and design, synthesis, and structure-activity relationship studies of novel drugs based on small organic molecules.	Assistant Prof. Takuya Okada	Advanced Bioorganic and Medicinal Chemistry
Condensed matter physics	We perform education and research on the relationship between atomic-level structure of materials and their physical properties. Emphasis is placed on the understanding transition mechanism via advanced experimental method for metallic, semiconducting, magnetic and superconducting materials. Methods of structural analysis such as X-ray diffraction and X-ray absorption spectroscopy, computational analysis and experimental techniques for physical transport properties will be introduced to proceed with the education and researches.	Prof. Tomohiko Kuwai Prof. Hiroyuki Ikemoto Associate Prof. Takashi Tayama Associate Prof. Keisuke Hatada Assistant Prof. Yuji Matsumoto	Advanced condensed-mater physics Physics of disordered system Advanced low temperature physics Transport properties of advanced materials Advanced strength of materials
Energy material basic science	We conduct wide-ranging education and research about what is a basic material, what kind of forces are working between the materials, how the Universe has been formed and developed and what mathematical expressions are appropriate for ultimate theories of material, time and space.	Associate Prof. Mitsuru Kakizaki	Advanced relativistic cosmology
Molecular energy basic science	We conduct education and research to identify molecular spectra and to derive precise molecular structures. These are important for physical chemistry, astronomy and environmental science by using laser and microwave spectroscopy. Techniques of trapping and cooling of atoms and molecules are also investigated and are applied to determine the precise frequencies and to verify the parameters of fundamental physics. We are also developing KAGRA, gravitational wave detector at Kamioka (Gifu prefecture), especially, technologies related with laser and mirror.	Prof. Yoshiki Moriwaki Prof. Kaori Kobayashi Associate Prof. Katsunari Enomoto Associate Prof. Kazuhiro Yamamoto	Advanced quantum electronics Advanced microwave molecular spectroscopy Advanced molecular spectroscopy Advanced gravitational wave physics

Materials science for electronic devices	We conduct education and research on the nanodevices, MEMS (Micro Electro Mechanical Systems) and their integrated circuits, and the growth and characterization of semiconductor heteroepitaxial films. Crystal structure and dielectric properties of ferroelectric single crystals, ceramics, and thin film are also studied.	Prof. Masayuki Mori Associate Prof. Toshio Kikuta	Advanced semiconductor thin film technology Ferroelectric devices
Organic optoelectronic devices engineering	We conduct education and research in the optoelectronics, thin-film engineering, alignment controlling, and application of optoelectronic devices using organic semiconductors.	Prof. Shigeki Naka	Advanced organic electronic device
Material design	We perform education and research on the relationship between electronic/atomic structure of materials and their mechanical/ physical properties. Emphasis is placed on the understanding deformation mechanism via advanced deformation method and the development of new functions via micro/nano-structure control, surface modification, or control of phase transformation/precipitation with metallic, ceramic, magnetic and superconducting materials. Electron microscopy, computational analysis and experimental techniques for physical transport properties will be introduced to proceed with the education and researches.	Prof. Kenji Matsuda Prof. Norio Nunomura Associate Prof. Takahiro Namiki Associate Prof. Seungwon Lee	Advanced nano material structural analysis Advanced computational materials modelling Transport properties of advanced materials Advanced strength of materials
Materials chemistry	Education and research are conducted into the fundamentals and applications of smelting, refining, and recycling processes of inorganic materials, mainly metals, by dry and wet methods.	Prof. Hideki Ono	Advanced refining engineering of materials
Plasma Science	Nonlinear and nonequilibrium phenomena of plasmas (such as nonlinear waves, turbulence, generation processes of non-thermal particles, and so on), and application of mathematical modeling	Associate Prof. Yasuhiro Nariyuki	Plasma astrophysics
Atomic and Molecular Physics	Education and research on the physics of fundamental processes in the interaction of high-energy photon with atoms and molecules will be carried out through experimental studies of photoionization processes of atoms and molecules using synchrotron radiation.	Prof. Yasumasa Hikosaka Lecturer Hayato Ohashi	Advanced Atomic and Molecular Physics Advanced Highly-charged Ion Physics
High frequency engineering	We conduct education and research on mobile communication systems, regarding multipath radio propagation, adaptive signal processing using array antennas and its over-the-air testing method, and angle of arrival estimation.	Associate Prof. Kazuhiro Honda	Advanced radio wave propagation
Photofunctional Material	Education and research are conducted into the design and synthesis of new photofunctional materials based on surface-modified nanomaterials that enable hybridization with organic or inorganic materials so that they can be used in the development of artificial photosynthesis systems and applications in the field of nanomedicine.	Prof. Yutaka Takaguchi	Advanced photofunctional material
Biomaterials Processing and Engineering	Education and research into the physico-chemical properties of biomaterials for tissue engineering and processing techniques for biomaterials at the nano- and micro-scale.	Assistant Prof. Shintaro Iwanaga	Advanced Biomedical Engineering
Particle design Process <Not Available>	We conduct education and research on particle design for creation of high-functional new materials accompanied by generation of fine powder and advanced technologies for development and design of their industrial manufacturing process.	Associate Prof. Taketoshi Kurooka Assistant Prof. Guiqing Liu	Advanced process analysis Selected topics in chemical and environmental process
Nanomaterials chemistry	We conduct education and research on synthesis and fabrication of photo-functional nanomaterials for light energy conversion and development of novel functions.	Lecturer Hiroyasu Nishi	Advanced photo-functional materials chemistry

photofunctional molecular science	We conduct educational research on elucidating reaction dynamics and excited-state structures for the photo-functional molecules converting light energy into chemical energy or electrical energy, especially the photo function of molecular systems containing heavy metals such as transition metal complexes, developing observation and analysis methods.	Lecturer Munetaka Iwamura	photochemistry of transition metal complexes
Synthetic coordination chemistry	We conduct education and research on synthesis, structures, and physical and chemical properties of mono- to multi-nuclear coordination compounds with various properties including luminescence, redox activity, and response to external stimuli.	Prof. Kiyoshi Tsuge Associate Prof. Hideki Ohtsu Associate Prof. Honoo Suzuki	Advanced synthetic coordination chemistry Advanced functional coordination chemistry Advanced structural solution chemistry
Synthetic organic chemistry	We conduct education and research on the design and synthesis of novel extended pi-conjugated systems, their application to supramolecular functional materials, the development of novel organic reactions, and their applications to the synthesis of biologically active natural compounds.	Prof. Naoto Hayashi Lecturer Hajime Yokoyama Assistant Prof. Junro Yoshino	Advanced organic nano science Advanced synthetic natural products chemistry Advanced organo-main group element chemistry
Biofunctional Chemistry	Elucidation of the molecular bases of naturally occurring RNAs acting as enzymes and receptors. Generation of novel structures and functions of artificial RNA molecules, assembly of these RNA molecules to construct RNA-based molecular systems.	Prof. Yoshiya Ikawa Lecturer Shigeyoshi Matsumura	Advanced bimolecular-system science Evolutionary Molecular Engineering
Environmental and analytical chemistry	Education and research will be conducted into the development of new separation materials and methods for efficient separation and concentration of trace elements contained in solutions, and their applications in analytical and environmental chemistry, such as determination of trace and ultra-trace elements in environmental and biological samples, recovery of valuable elements in waste, and removal of hazardous elements from waste.	Prof. Shigehiro Kagaya Associate Prof. Makoto Genmei Assistant Prof. Akira Kanno	Advanced separation science for trace element Advanced biointerface science Advanced analytical chemistry for living organisms
Computational Biomolecular Science	We construct an interaction model for biomolecules based on quantum chemical principles and analyze their molecular structure and dynamics through computer simulation technique. By calculating static and dynamic physical quantities based on statistical mechanics theories from the molecular trajectories obtained through molecular simulations, we elucidate biological phenomena at the molecular level.	Associate Prof. Tatsuya Ishiyama	Biomolecular Simulation
Nanobiomolecular Engineering	The aim of our research is to understand the chemical and molecular mechanism of biological activities, and to develop new bio-sensing methods.	Associate Prof. Masafumi Sakono	Advanced Biofunctional Engineering
Nano-biomaterial design	Research theme of this field is that 1) design and synthesis of functional molecules, biopolymers, and proteins for constructing biomedical devices, and 2) development of novel functional biomaterials using biopolymer, protein and functional molecules. Additionally, we aim to elucidate and understand the correlation between biomaterial and biomolecules such as cell, protein, bacteria etc. Various information obtained by various in vitro and in vivo experiments will be used to develop biomedical devices that can be used in practical applications.	Associate Prof. Tadashi Nakaji	Lecture for development of nanomaterials and biomaterials

Synthetic inorganic chemistry	We conduct education and research on the preparation, characterization and physical properties of molecular solid-state systems based on organic, inorganic and organometallic molecules, including surface-functionalized metal nanoparticles, which exhibit novel functions such as electrical conductivity and magnetism.	Associate Prof. Akira Miyazaki	Advanced properties of molecular solid-state materials
Process Chemistry for harmaceuticals	Education and research on the development of efficient synthetic methods for biologically active compounds, including pharmaceuticals, and various functional organic molecules.	Prof. Hitoshi Abe	Advanced Synthetic Chemistry of Functional Molecules
Energy environment science	We conduct education and research on the physicochemical properties of hydrogen isotopes and the development of functional materials for safe and efficient utilization of hydrogen isotopes as fuels of fusion reactors and hydrogen energy systems. Our research topics are in an interdisciplinary field that covers materials science, physical chemistry, nuclear fusion engineering, and hydrogen energy engineering.	Prof. Takayuki Abe Associate Prof. Hidehisa Hagiwara Associate Prof. Masanori Hara Lecturer Akira Taguchi Assistant Prof. Satoshi Akamaru	Advanced hydrogen energy materials Energy conversion engineering Advanced lecture for measurement and detection of radiation Advanced catalytic transformation Advanced inorganic functional materials
Molecularreaction engineering	We aim to solve energy and environmental problems for the foundation of a future society by making full use of knowledge about catalytic chemistry, chemical reaction engineering, and molecular dynamics. Our study focuses on advanced application of resources such as biomass, carbon dioxide, green hydrogen and sun-light, as well as chemical reaction and chemical engineering processes that pose low environmental burdens. It also explores nano-materials with novel functions.	Prof. Noritatsu Tsubaki	Advanced catalysis engineering

（3）Sustainable Global Environmental Studies Program

We conduct education and research on the past, present, and future history and changes of the atmosphere, hydrosphere, geosphere, and biosphere that make up the Earth's environment, as well as their interactions, from the earth's interior to outer space, to develop human resources with interdisciplinary knowledge and thinking ability. Specifically, education and research are conducted on the structure, behavior, evolution, and diversity of organisms in the Earth's environment, and the mechanisms of transmission, expression, and regulation of genetic information. Based on the knowledge obtained from these studies, we conduct education and research on (1) genetic engineering for the industrial production of useful materials, (2) analysis of the relationship between biological functions and the internal and external environment, (3) conservation and restoration of the environment using chemical and biological methods, (4) changes in the crustal structure, (5) prediction of natural disasters, and (6) disaster prevention technology. Furthermore, we also work on issues aimed at the formation of a sustainable society.

Educational field	Education and Research	Supervisors	Related lectures
Geosphere material system science	We conduct education and research for unveiling the origins of underground resources and changes in the global environment during 4.6 billion years of the Earth history. The primary targets of our study are solid substances that record the Earth history such as minerals, rocks, and sedimentary strata. From the targets, we explore the material cycle, chemical reaction, heat history, and environmental changes of the Earth from its birth to the present on the basis of accurate age dating.	Prof. Yasuo Ishizaki Prof. Shin-ichi Sano Associate Prof. Ken-ichi Yasue Assistant Prof. Hikaru Sawada	Advanced volcanology Earth and life history Advanced neotectonics Advanced earth material science

Disaster prevention science	Hokuriku area has been suffering from various natural disasters: heavy snow fall, winter thunderstorm, storm surge, earthquakes, etc. In order to mitigate the damage by such disasters, our research advances our understanding of the dynamics of the Earth's atmosphere, hydrosphere and lithosphere. This major is also committed to providing students with the opportunities to apply their research to problems in local communities.	Prof. Tohru Watanabe Prof. Kazuaki Yasunaga Prof. Kazuma Aoki Prof. Konosuke Sugiura Prof. Bunmei Taguchi Prof. Masahiro Hori Associate Prof. Wataru Shimada Associate Prof. Atsushi Hamada	Advanced physics of the Earth's interior Advanced dynamic meteorology Advanced Atmospheric radiation Advanced geoglaciology Advanced ocean and climate dynamics Advanced remote sensing Advanced snow and ice science Advanced atmospheric physics
Earth systems science	We conduct geological and geophysical field investigations, computational analyses, and laboratory experiments of rocks and sediments, mainly with paleomagnetic and rock-magnetic methods, in order to clarify internal structures and their evolution in the solid Earth, and tectonic movements and environmental changes though geologic time in the Earth system. We aim to develop talented people who understand complex interaction among various components of the Earth system.	Prof. Naoto Ishikawa Associate Prof. Kazuo Kawasaki Assistant Prof. Kohei Hotta	Advanced paleomagnetism and rock magnetism Resource and environmental geophysics Advanced geodesy
Regulatory biology	Education and research are conducted on adaptive significance of biological rhythms and sleep system, endocrine system, and behavioral system of an individual organism or population in changing external environments.	Prof. Kouhei Matsuda Associate Prof. Tomoko Yoshikawa Lecturer Norifumi Konno Lecturer Tomoya Nakamachi Lecturer Eri Morioka	Advanced Biochemistry for Organic Molecules Advanced biological clocks Advanced endocrinology Advanced behavioral physiology Advanced invertebrate neuroethology
Life information science	We conduct education and research on molecular mechanisms of cell differentiation and organ development in higher plants, structure, and expression of plant genome. The perception and transduction of environmental signals such as light and hormones are also studied.	Prof. Ichirou Karahara Lecturer Masayuki Yamamoto Lecturer Daisuke Tamaoki	Advanced plant morphology Advanced plant molecular genetics Advanced plant cell biology
Living structure science	We analyze various processes in the biological developments, morphogenesis, structural features, phylogenetic relationships, diversity, behavioral ecology and evolution through comparative study in living structures. Thus, we conduct education and research to understand the fundamental principles and rules.	Associate Prof. Yuji Yamazaki Associate Prof. Kiyoto Maekawa Associate Prof. Tsutomu Tsuchida Assistant Prof. Kyouko Sato	Living structure science Advanced evolutionary developmental biology Advanced biology of symbiosis Advanced plant cytotaxonomy

Environmental and analytical chemistry	Our group focuses on exploring techniques from chemical approaches in solving and clarifying environmental problems. For example, we are developing simple and rapid analytical methods to measure harmful components related to environmental pollution. The dynamics of these components are then studied, and based on these findings, we perform basic research to remove the pollutants from waste water. Furthermore, our research also includes geochemical monitoring of CO_2 which consists of water rock interaction in geothermal fields. We also clarify and evaluate material cycling systems and mechanisms and changes in oceanic and terrestrial water systems, using major ions, trace elements, and stable isotopes.	Prof. Jing Zhang Prof. Hideki Kuramitsu Prof. Keiji Horikawa Lecturer Kazuto Sazawa Project Assistant Prof. Hidetaka Kobayashi Project Assistant Prof. Takanori Kagoshima	Advanced marine geochemistry Advanced water analysis Isotope studies in environmental science Advanced environmental water quality Advanced Ocean Dynamics Advanced Solid Earth Geochemistry
Environmental Biology	We conduct research on the functions of organisms, which are important components of the biosphere, from the molecular to ecosystem level. In particular, education and research will be conducted on the effects of environmental factors such as light, water, metal ions, and chemical substances on the physiological functions of organisms, the effects of global environmental change, and interactions between individual organisms and between species.	Prof. Daisuke Tanaka Prof. Hiroshi Ishii Associate Prof. Hiroyuki Kamachi Associate Prof. Kenji Kashiwagi Lecturer Akihiro Sakatoku Lecturer Tamihisa Oota	Advanced microbiology Advanced plant ecology Advanced plant physiology Advanced stratigraphy Advanced environmental molecular biology Advanced isotope ecology
Environmental Sustainability Science	From the perspective of the use and conservation of natural ecosystems, agricultural lands, plantations, and other green spaces, we will guide environmental sustainability research for Ph.D students.	Prof. Naoya Wada	Advanced Conservation Ecology

（4）Advanced Engineering Program

Education and research are conducted in the fields of mechanical engineering, electronics, robotics, materials science, and civil engineering to develop human resources with broad knowledge and specialized skills in engineering fields and the ability to solve problems in a sustainable society. Specifically, education and research will be conducted in the following fields and also aim at exchanges among the fields: a wide range of fields that integrate electronic and electrical engineering and mechanical engineering, with an understanding of natural sciences such as electromagnetism and various dynamics, the creation of a foundation for industrial and technological innovation through material innovation based on material science, and the design of safe, secure and comfortable cities through the advanced use of data science.

Educational field	Education and Research	Supervisors	Related lectures
Organic optoelectronic devices engineering	We conduct education and research in the optoelectronics, thin-film engineering, alignment controlling, and application of optoelectronic devices using organic semiconductors.	Prof. Shigeki Naka Associate Prof. Masahiro Morimoto	Advanced organic device Advanced organic thin films
High frequency engineering	We conduct education and research on mobile communication systems, regarding multipath radio propagation, adaptive signal processing using array antennas and its over-the-air testing method, and angle of arrival estimation.	Associate Prof. Kazuhiro Honda	Advanced radio wave propagation
Materials science for electronic devices	We conduct education and research on the nanodevices, MEMS (Micro Electro Mechanical Systems) and their integrated circuits, and the growth and characterization of semiconductor heteroepitaxial films. Crystal structure and dielectric properties of ferroelectric single crystals, ceramics, and thin film are also studied.	Prof. Masayuki Mori Associate Prof. Toshio Kikuta	Advanced semiconductor thin film technology Ferroelectric devices

Material design	We perform education and research on the relationship between electronic/atomic structure of materials and their mechanical/ physical properties. Emphasis is placed on the understanding deformation mechanism via advanced deformation method and the development of new functions via micro/nano-structure control, surface modification, or control of phase transformation/precipitation with metallic, ceramic, magnetic and superconducting materials. Electron microscopy, computational analysis and experimental techniques for physical transport properties will be introduced to proceed with the education and researches.	Prof. Kenji Matsuda Prof. Norio Nunomura Associate Prof. Takahiro Namiki Associate Prof. Seungwon Lee Assistant Prof. Taiki Tsuchida	Advanced nano material structural analysis Advanced computational materials modelling Transport properties of advanced materials Advanced strength of materials Advanced Materials Fabrication Engineering
Materials chemistry	Education and research are conducted into the fundamentals and applications of smelting, refining, and recycling processes of inorganic materials, mainly metals, by dry and wet methods and into the improvement of corrosion resistance, surface modification, and surface functionality by electrochemical methods.	Prof. Hideki Ono Associate Prof. Masahiko Hatakeyama	Advanced refining engineering of materials Advanced chemical analysis
Photofunctional Material	Education and research are conducted into the design and synthesis of new photofunctional materials based on surface-modified nanomaterials that enable hybridization with organic or inorganic materials so that they can be used in the development of artificial photosynthesis systems and applications in the field of nanomedicine.	Prof. Yutaka Takaguchi	Advanced photofunctional material
Material process	Various theories and technologies have been established in the creation and application processes of excellent new materials and functional materials, and in the molding of metals. Education and research are conducted on the industrial application of molecular functional materials.	Prof. Seiji Saikawa Prof. Tetsuo Aida Associate Prof. Takashi Hashizume	Advanced material forming and engineering Advanced material manufacturing and plasticity theory Advanced Hydrothermal Processing for Inorganic Materials
Materials for Biofunctionalization	Education and research will be conducted into the design of artificial materials from the viewpoints of both macroscopic shape and microscopic material properties, not only to improve the functionality and performance of the material itself, but also to improve the functionality of the living body through the application of the material.	Prof. Takuya Ishimoto	Advanced Biomaterials Engineering
Transfer phenomenon system	We conduct education and research on transport phenomena of momentum, heat and mass occurring in industrial manufacturing processes such as polymer coating and alloy casting, aiming to develop mathematical models for simulation of unit operations constituting a process, methods for optimization of operating conditions, and technologies for saving energy and cost.	Associate Prof. Masamichi Yoshida	Theory of transport phenomena
Molecular mechanical engineering	We conduct education and research on molecular dynamics and quantum mechanics for new materials as well as on the evaluation of mechanical function and performance of molecular devices including electronic ones.	Prof. Takeshi Seta Lecturer Tatiana N. ZOLOTOUKHINA	Advanced Computational Thermo-Fluid Dynamics Advanced nano dynamics
Strength and fracture of engineering materials	We conduct education and research on establishment of optimal and safe design methods for mechanical components and structures. We also focus on creation and application of new functional materials through understanding the strength and fracture mechanisms of engineering materials, establishment of database for material properties, and reliability analysis.	Prof. Noriyasu Oguma Associate Prof. Koichi kasaba Associate Prof. Kenichi Masuda	Advanced mechanical engineering design for special environments Strength and properties of advanced functional materials Advanced nonlinear structural analysis

Function control engineering	The functions of high-speed, high-precision and complex systems range from non-bio to bio functions and have become subdivided. We conduct education and research to develop elements and systems for measurement. We also focus on control systems that can efficiently deal with high functionalization and multi-functionalization as well as establishment of the theories.	Prof. Tohru Sasaki Prof. Kenji Hirata Prof. Yoshiyuki Matsumura Prof. Toshiyuki Yasuda Associate Prof. Kenji Terabayashi Associate Prof. Junya Yamauchi Lecturer Masahiro Sekimoto	Advanced measurement system Decentralized and cooperative control systems Advanced intelligent system Advanced adaptive systems Advanced image measurement Advanced Learning-Based Control Advanced robot dynamics and control theory
Material processing	We conduct education and research on processing systems that not only improve the level of processing technologies and processing quality but also respond to superprecision and miniaturization by developing processing methods for new materials with multiple functions and elucidate their processing mechanisms.	Prof. Tomomi Shiratori Lecturer Noboru Takano	Advanced plasticity process Advanced microfabrication
Solid mechanics	On the basis of mechanics such as studies on the strength of materials, computational mechanics, and experimental mechanics, we perform education and research on the strength of new materials, their combined materials, and functional materials. We also carry out mechanical evaluation of machine, components, and structures.	Prof. Katsuyuki Kida Associate Prof. Koshiro Mizobe	Advanced solid Mechanics Advanced fracture mechanics
Intelligent systems	We conduct education and research on robotics, medical robotics system, rehabilitation systems, intelligent algorithms, and intelligent control.	Associate Prof. Hideki Toda	Biosignal measurement and processing for robot application
Bio-information engineering	We conduct education and research which promote design and development of the method of measuring biological information and the method of analyzing biological information for estimating a biological state.	Prof. Kazuki Nakajima	Advanced bio-instrumentation engineering
Computer applications engineering	We conduct education and research on human and traffic flow measurement for industrial applications using information sensing technology, human well being measurement technology using smart devices, QoE of multimedia applications/services, intellectual image processing for ITS, energy management system using IoT devices, construction DX technology.	Prof. Yuukou Horita	Advanced image communication
Ultra-high frequency engineering	We conduct education and research on electromagnetic simulation, device fabrication and measurement, and signal and image processing. Furthermore, we conduct education and research on imaging in the millimeter and terahertz wave regions.	Associate Prof. Tatsuo Nozokido Associate Prof. Masafumi Fujii	Advanced ultra-high frequency engineering Advanced FDTD analysis
Electric energy system	On the basis of high efficient power conversion and high voltage/current technologies, we conduct education and research on linear motor and actuator, magnetic levitation, magnetic bearing, power electronics, renewable energy utilization, pulsed power, high power pulsed particle beam, atmospheric pressure and high density plasma, and observation and projection of lightning discharge.	Prof. Hiroaki Ito Prof. Takahisa Ohji Associate Prof. Kenji Amei	High voltage and high current engineering Advanced electromagnetic engineering Advanced power conversion engineering

Thermofluid system	Our research in fluid and thermal sciences has both fundamental and applied studies in energy conversion, heat and mass transport, and technologies for their usage. Basic research efforts in energy systems include multiphase flows, coherent turbulent structure, and bioengineering.	Prof. Seiichiro Izawa Lecturer Atsushi Kase Lecturer Daisuke Watanabe	Turbulent flow and transport Advanced applied fluid engineering Advanced applied fluid engineering
Design Management	・Design excellence of public space and urban infrastructure from the perspectives of functionality and urban landscape ・Institutional capacity and governance (e.g., international comparative studies of public procurement systems) ・Revitalization of and community building in urban areas (e.g., residential living in the urban core, street audit and analysis)	Prof. Yoshiaki Kubota Assistant Prof. Yongcheng Wang	Advanced Design for Urban spaces
Hydraulic Engineering	We will elucidate the mechanisms and scenarios of various environmental problems and disaster prevention problems in rivers, coasts, and lakes. Furthermore, we will conduct education and research on measures to solve these problems from both hardware and software aspects.	Prof. Ichiro Kimura	Advanced River Hydraulics
Reliability design on geotechnical structure	Education and research of reliability design on geotechnical structure from the viewpoints, heterogeneous characteristics of natural ground, uncertainties of subsurface exploration and resistance evaluation of geotechnical structure, is conducted.	Prof. Takashi Hara	Special lecture of geotechnical structure design
Infrastructure Planning and Management	Education and research on the following points will be conducted. -Social impact assessment of public transportation development. -Methods of public participation in transportation and urban planning. Evaluation of its effectiveness. -Analyze the impact of disasters on transportation and propose countermeasures. -Evaluation of transportation nodes and pedestrian spaces.	Associate Prof. Hiroto Inoi	Advanced Urban and Transportation Planning
evaluation of structural performance	how to set the required performance, how to satisfy the required performance	Associate Prof. Tetsuya Kohno	Structural Design and Maintenance Engineering
Structural Mechanics and Bridge Engineering	We conduct education and research on structural mechanics and bridge engineering. In specific, with regard to steel, steel-concrete composite and fiber reinforced polymer bridge structures, the mechanical behavior of connection of members, the load carrying mechanism, the performance evaluation, the rational design and so on are studied.	Associate Prof. Yasuo Suzuki	Advanced Bridge Engineering
DX Design Science for Resilience	We conduct teaching and research on standardized methodology for design of resilient society from the perspective of disaster behavior science, such as standardized disaster management plans and manuals for rational response, technology of dynamic simulation for effective disaster response, and methodology of DX design for safe and secure society.	Associate Prof. Munenari Inokuchi	Advanced Risk Management

Enrollment in April 2025

Guide of Graduate School of Science and Engineering (Doctoral Course)

The Doctoral Program in Science and Engineering of Graduate School of Science and Engineering consists of four programs: Mathematical Informatics and Data Science Program, Life, Material and Energy Sciences Program, Sustainable Global Environmental Studies Program, and Advanced Engineering Program. The overview of each program is as follows.

(1) Mathematical Informatics and Data Science Program

In today's rapidly advancing information society, there is a need for further improvement of the environment to cope with an aging society and to enable people in general to live safely and comfortably.
In this program, we aim to train advanced professionals and researchers who can foresee further advancements in the informatized society and equip themselves with a solid foundation in mathematics, information science, and data science. They will gain comprehensive knowledge in mathematical informatics, critical thinking skills, and problem-solving abilities, allowing them to play important roles in the increasingly informatized society of the future.

Educational field	Education and Research	Supervisors	Related lectures
Basic computer engineering	We conduct education and research on software development for practical use of computers, analysis and development of algorithms for useful software and advanced signal processing analysis in computer systems.	Prof. Shigeki Hirobayashi Associate Prof. Tadanobu Misawa Lecturer Takuma Watanabe	Advanced signal processing Advanced machine learning Microwave Sensing
Bio-medical informatics	We conduct education and research on visual information processing engineering, emotional information processing engineering, sensing and imaging technologies, signal and image processing, pattern recognition, color engineering, evaluation and analysis of CG/3-D visible images, optical and visual environment engineering, traffic visual environment engineering, urban landscape lighting, the hot issues of development of universal design for elderly persons and people with synesthesia, visual neurophysiology, neural computing, synaptic plasticity, bioinformatics, evaluation of human cognition and social interaction and development of hardware and software for image information processing inspired by intriguing human sensory information processing mechanisms.	Prof. Hideyuki Hasegawa Prof. Takashi Katagiri Prof. Toshihide Tabata Associate Prof. Mamoru Takamatsu Associate Prof. Yusuke Oshima Associate Prof. Ryo Nagaoka Assistant Prof. Masaaki Omura	Advanced Medical Ultrasonics Advanced Bio-medical Optics Advanced biological information processing Advanced kansei information processing Advanced clinical informatics engineering Advanced medical ultrasonic measurement Advanced Medical Ultrasonics
Human Informatics	We conduct education and research on the analysis and evaluation of human cognition and social interaction, and on the design of information technologies that support people's intellectual activities in real life. For this purpose, we employ a combination of multimodal measurement of brain, psychological, physiological, and behavioral activities with data science and artificial intelligence techniques.	Prof. Takayuki Nozawa Associate Prof. Shigeki Ikeda	Advanced Cognitive Interaction Brain Information Engineering
Artificial intelligence	We conduct education and research on the design, analysis, and evaluation of various artificial intelligent methodologies, including the artificial neural networks which are inspired by the human brain's architecture and information processing mechanisms, the deep learning which is able to learn by itself, particle swarm optimization, ant colony optimization, error back-propagation method, genetic algorithm, evolutionary strategy, and other machine learning technologies.	Prof. Shangce Gao Assistant Prof. Zhenyu Lei	Advanced computational intelligence Advanced Deep Learning

Computational Science	We conduct education and research on designing, implementing, and using mathematical models, numerical analysis, and numerical simulations to analyze and solve scientific problems.	Associate Prof. Takayuki Haruki	Advanced Computational Science
Mathematical analysis	In order to respond to the rapid development of state-of-the-art technologies such as computers and communication technologies, we actively conduct research on information mathematical science from a position to analyze the mathematical models and mathematical rules underlying them, and conduct education on representation theory, nonlinear analysis and stochastic process. We also aim to cultivate experts with the ability to analyze mathematical phenomena making full use of computers; such experts would be able to perform research and development that are necessary for running advanced information of the science and technology society.	Prof. Hiroyuki Yamane Prof. Masato Kikuchi Prof. Keiichi Ueda Associate Prof. Hideo Deguchi Associate Prof. Masakazu Akiyama	Advanced representation theory Advanced stochastic process Advanced computational mathematics Advanced mathematical phenomenal analysis Advanced mathematical sciences based on modeling and analysis
Mathematical structural science	We conduct education and research on the basic theory of mathematical science that supports the society depending on the complex and advanced science and technology, search for reliability in a comprehensive manner, and explore methods of mathematical analysis for mathematical phenomena. We also aim to cultivate specialists who excel in mathematical thinking and logic-composing by deepening their ability to analyze mathematical structures.	Prof. Keiko Fujita Prof. Takashi Koda Associate Prof. Tatsuya Kawabe Associate Prof. Iwao Kimura	Advanced complex analysis Advanced geometry Advanced theory of geometric structures Advanced number theory
Quantum information	We are working on quantum information theory where application of quantum mechanics offers revolutionary improvements to information processing. Our interest includes proposal of quantum cryptgraphic protocols and side-channel attacks against them, security analyses of quantum protocols, and analyses of quantum repeaters.	Prof. Kiyoshi Tamaki Lecturer Akihiro Mizutani	Advanced quantum informationprocessing Advanced quantum computing

（2）Life, Material and Energy Sciences Program

Our course offers a wide range of research fields including life and material chemistry, advanced clean energy, physics and applied physics which are keys to modern science and technology and indispensable for our future. Students will acquire skills and knowledge, both basic and applied, through reading academic articles, giving scientific reports, and participating in conferences and symposiums as well as communications among researchers and research fields. We are proud of producing highly innovative graduates.

Educational field	Education and Research	Supervisors	Related lectures
Neural system and cell electrical engineering	We conduct education and research on the following topics. ・Phase-dependent processing of sensory information in synchronous neural activities and dynamic interaction among the nonlinear oscillators in a brain as well as between the brain and rhythmic sensory inputs, using relatively simple invertebrate system. ・Applications to cell sensors and cell separation as a fusion field of cell engineering and electrical engineering.	Prof. Shigenori Kawahara Lecturer Minoru Suga	Advanced Lecture on Dynamics in Brain and Neural Systems Advanced Lecture on Biological Dielectric Phenomena

Molecular and cellular bioengineering	Education and research will be conducted on the development of monoclonal antibodies for diagnostic and therapeutic use, as well as on the functional analysis of biomolecules using antibodies and their application in biotechnology. Education and research will be conducted to elucidate the mechanism of protein metabolism in vivo and develop artificial regulation methods of protein metabolism. Education and research will be conducted to develop material production processes by bioreaction engineering using microorganisms and to elucidate their microbial cellular mechanisms. Education and research will be conducted to deepen our understanding of life using synthetic biology techniques, which aim to artificially build life and biological systems by reconstituting biological molecules, and apply this knowledge to various fields, such as environmental issues and advancing healthcare.	Prof. Nobuyuki Kurosawa Associate Prof. Tomonao Inobe Associate Prof. Tatsuhiko Ozawa Lecturer Maki Moriwaki Assistant Prof. Seiichi Koike	Advanced Course in Antibody Engineering Advanced Course in Protein Metabolism Advanced Course in Immune Engineering Advanced Course in Microbial Reaction Engineering Advanced Course in Synthetic Cell Biology
Pharmacology	Education and research will be conducted on intractable chronic pain diseases such as postherpetic neuralgia, migraine, and cancer pain, and intractable chronic pruritic diseases such as atopic dermatitis, in order to elucidate their pathological mechanisms and to discover novel therapeutic agents.	Associate Prof. Ichiro Takasaki	Advanced Pharmacology and Genetic Engineering
Medicinal Chemistry	Research and education on drug discovery research, including synthetic studies of natural products exhibiting unique biological activities and design, synthesis, and structure-activity relationship studies of novel drugs based on small organic molecules.	Assistant Prof. Takuya Okada	Advanced Bioorganic and Medicinal Chemistry
Condensed matter physics	We perform education and research on the relationship between atomic-level structure of materials and their physical properties. Emphasis is placed on the understanding transition mechanism via advanced experimental method for metallic, semiconducting, magnetic and superconducting materials. Methods of structural analysis such as X-ray diffraction and X-ray absorption spectroscopy, computational analysis and experimental techniques for physical transport properties will be introduced to proceed with the education and researches.	Prof. Tomohiko Kuwai Prof. Hiroyuki Ikemoto Associate Prof. Takashi Tayama Associate Prof. Keisuke Hatada Assistant Prof. Yuji Matsumoto	Advanced condensed-mater physics Physics of disordered system Advanced low temperature physics Transport properties of advanced materials Advanced strength of materials
Energy material basic science	We conduct wide-ranging education and research about what is a basic material, what kind of forces are working between the materials, how the Universe has been formed and developed and what mathematical expressions are appropriate for ultimate theories of material, time and space.	Associate Prof. Mitsuru Kakizaki	Advanced relativistic cosmology
Molecular energy basic science	We conduct education and research to identify molecular spectra and to derive precise molecular structures. These are important for physical chemistry, astronomy and environmental science by using laser and microwave spectroscopy. Techniques of trapping and cooling of atoms and molecules are also investigated and are applied to determine the precise frequencies and to verify the parameters of fundamental physics. We are also developing KAGRA, gravitational wave detector at Kamioka (Gifu prefecture), especially, technologies related with laser and mirror.	Prof. Yoshiki Moriwaki Prof. Kaori Kobayashi Associate Prof. Katsunari Enomoto Associate Prof. Kazuhiro Yamamoto	Advanced quantum electronics Advanced microwave molecular spectroscopy Advanced molecular spectroscopy Advanced gravitational wave physics

Materials science for electronic devices	We conduct education and research on the nanodevices, MEMS (Micro Electro Mechanical Systems) and their integrated circuits, and the growth and characterization of semiconductor heteroepitaxial films. Crystal structure and dielectric properties of ferroelectric single crystals, ceramics, and thin film are also studied.	Prof. Masayuki Mori Associate Prof. Toshio Kikuta	Advanced semiconductor thin film technology Ferroelectric devices
Organic optoelectronic devices engineering	We conduct education and research in the optoelectronics, thin-film engineering, alignment controlling, and application of optoelectronic devices using organic semiconductors.	Prof. Shigeki Naka	Advanced organic electronic device
Material design	We perform education and research on the relationship between electronic/atomic structure of materials and their mechanical/ physical properties. Emphasis is placed on the understanding deformation mechanism via advanced deformation method and the development of new functions via micro/nano-structure control, surface modification, or control of phase transformation/precipitation with metallic, ceramic, magnetic and superconducting materials. Electron microscopy, computational analysis and experimental techniques for physical transport properties will be introduced to proceed with the education and researches.	Prof. Kenji Matsuda Prof. Norio Nunomura Associate Prof. Takahiro Namiki Associate Prof. Seungwon Lee	Advanced nano material structural analysis Advanced computational materials modelling Transport properties of advanced materials Advanced strength of materials
Materials chemistry	Education and research are conducted into the fundamentals and applications of smelting, refining, and recycling processes of inorganic materials, mainly metals, by dry and wet methods.	Prof. Hideki Ono	Advanced refining engineering of materials
Plasma Science	Nonlinear and nonequilibrium phenomena of plasmas (such as nonlinear waves, turbulence, generation processes of non-thermal particles, and so on), and application of mathematical modeling	Associate Prof. Yasuhiro Nariyuki	Plasma astrophysics
Atomic and Molecular Physics	Education and research on the physics of fundamental processes in the interaction of high-energy photon with atoms and molecules will be carried out through experimental studies of photoionization processes of atoms and molecules using synchrotron radiation.	Prof. Yasumasa Hikosaka Lecturer Hayato Ohashi	Advanced Atomic and Molecular Physics Advanced Highly-charged Ion Physics
High frequency engineering	We conduct education and research on mobile communication systems, regarding multipath radio propagation, adaptive signal processing using array antennas and its over-the-air testing method, and angle of arrival estimation.	Associate Prof. Kazuhiro Honda	Advanced radio wave propagation
Photofunctional Material	Education and research are conducted into the design and synthesis of new photofunctional materials based on surface-modified nanomaterials that enable hybridization with organic or inorganic materials so that they can be used in the development of artificial photosynthesis systems and applications in the field of nanomedicine.	Prof. Yutaka Takaguchi	Advanced photofunctional material
Biomaterials Processing and Engineering	Education and research into the physico-chemical properties of biomaterials for tissue engineering and processing techniques for biomaterials at the nano- and micro-scale.	Assistant Prof. Shintaro Iwanaga	Advanced Biomedical Engineering
Particle design Process <Not Available>	We conduct education and research on particle design for creation of high-functional new materials accompanied by generation of fine powder and advanced technologies for development and design of their industrial manufacturing process.	Associate Prof. Taketoshi Kurooka Assistant Prof. Guiqing Liu	Advanced process analysis Selected topics in chemical and environmental process
Nanomaterials chemistry	We conduct education and research on synthesis and fabrication of photo-functional nanomaterials for light energy conversion and development of novel functions.	Lecturer Hiroyasu Nishi	Advanced photo-functional materials chemistry

photofunctional molecular science	We conduct educational research on elucidating reaction dynamics and excited-state structures for the photo-functional molecules converting light energy into chemical energy or electrical energy, especially the photo function of molecular systems containing heavy metals such as transition metal complexes, developing observation and analysis methods.	Lecturer Munetaka Iwamura	photochemistry of transition metal complexes
Synthetic coordination chemistry	We conduct education and research on synthesis, structures, and physical and chemical properties of mono- to multi-nuclear coordination compounds with various properties including luminescence, redox activity, and response to external stimuli.	Prof. Kiyoshi Tsuge Associate Prof. Hideki Ohtsu Associate Prof. Honoo Suzuki	Advanced synthetic coordination chemistry Advanced functional coordination chemistry Advanced structural solution chemistry
Synthetic organic chemistry	We conduct education and research on the design and synthesis of novel extended pi-conjugated systems, their application to supramolecular functional materials, the development of novel organic reactions, and their applications to the synthesis of biologically active natural compounds.	Prof. Naoto Hayashi Lecturer Hajime Yokoyama Assistant Prof. Junro Yoshino	Advanced organic nano science Advanced synthetic natural products chemistry Advanced organo-main group element chemistry
Biofunctional Chemistry	Elucidation of the molecular bases of naturally occurring RNAs acting as enzymes and receptors. Generation of novel structures and functions of artificial RNA molecules, assembly of these RNA molecules to construct RNA-based molecular systems.	Prof. Yoshiya Ikawa Lecturer Shigeyoshi Matsumura	Advanced bimolecular-system science Evolutionary Molecular Engineering
Environmental and analytical chemistry	Education and research will be conducted into the development of new separation materials and methods for efficient separation and concentration of trace elements contained in solutions, and their applications in analytical and environmental chemistry, such as determination of trace and ultra-trace elements in environmental and biological samples, recovery of valuable elements in waste, and removal of hazardous elements from waste.	Prof. Shigehiro Kagaya Associate Prof. Makoto Genmei Assistant Prof. Akira Kanno	Advanced separation science for trace element Advanced biointerface science Advanced analytical chemistry for living organisms
Computational Biomolecular Science	We construct an interaction model for biomolecules based on quantum chemical principles and analyze their molecular structure and dynamics through computer simulation technique. By calculating static and dynamic physical quantities based on statistical mechanics theories from the molecular trajectories obtained through molecular simulations, we elucidate biological phenomena at the molecular level.	Associate Prof. Tatsuya Ishiyama	Biomolecular Simulation
Nanobiomolecular Engineering	The aim of our research is to understand the chemical and molecular mechanism of biological activities, and to develop new bio-sensing methods.	Associate Prof. Masafumi Sakono	Advanced Biofunctional Engineering
Nano-biomaterial design	Research theme of this field is that 1) design and synthesis of functional molecules, biopolymers, and proteins for constructing biomedical devices, and 2) development of novel functional biomaterials using biopolymer, protein and functional molecules. Additionally, we aim to elucidate and understand the correlation between biomaterial and biomolecules such as cell, protein, bacteria etc. Various information obtained by various in vitro and in vivo experiments will be used to develop biomedical devices that can be used in practical applications.	Associate Prof. Tadashi Nakaji	Lecture for development of nanomaterials and biomaterials

Synthetic inorganic chemistry	We conduct education and research on the preparation, characterization and physical properties of molecular solid-state systems based on organic, inorganic and organometallic molecules, including surface-functionalized metal nanoparticles, which exhibit novel functions such as electrical conductivity and magnetism.	Associate Prof. Akira Miyazaki	Advanced properties of molecular solid-state materials
Process Chemistry for harmaceuticals	Education and research on the development of efficient synthetic methods for biologically active compounds, including pharmaceuticals, and various functional organic molecules.	Prof. Hitoshi Abe	Advanced Synthetic Chemistry of Functional Molecules
Energy environment science	We conduct education and research on the physicochemical properties of hydrogen isotopes and the development of functional materials for safe and efficient utilization of hydrogen isotopes as fuels of fusion reactors and hydrogen energy systems. Our research topics are in an interdisciplinary field that covers materials science, physical chemistry, nuclear fusion engineering, and hydrogen energy engineering.	Prof. Takayuki Abe Associate Prof. Hidehisa Hagiwara Associate Prof. Masanori Hara Lecturer Akira Taguchi Assistant Prof. Satoshi Akamaru	Advanced hydrogen energy materials Energy conversion engineering Advanced lecture for measurement and detection of radiation Advanced catalytic transformation Advanced inorganic functional materials
Molecularreaction engineering	We aim to solve energy and environmental problems for the foundation of a future society by making full use of knowledge about catalytic chemistry, chemical reaction engineering, and molecular dynamics. Our study focuses on advanced application of resources such as biomass, carbon dioxide, green hydrogen and sun-light, as well as chemical reaction and chemical engineering processes that pose low environmental burdens. It also explores nano-materials with novel functions.	Prof. Noritatsu Tsubaki	Advanced catalysis engineering

（3）Sustainable Global Environmental Studies Program

We conduct education and research on the past, present, and future history and changes of the atmosphere, hydrosphere, geosphere, and biosphere that make up the Earth's environment, as well as their interactions, from the earth's interior to outer space, to develop human resources with interdisciplinary knowledge and thinking ability. Specifically, education and research are conducted on the structure, behavior, evolution, and diversity of organisms in the Earth's environment, and the mechanisms of transmission, expression, and regulation of genetic information. Based on the knowledge obtained from these studies, we conduct education and research on (1) genetic engineering for the industrial production of useful materials, (2) analysis of the relationship between biological functions and the internal and external environment, (3) conservation and restoration of the environment using chemical and biological methods, (4) changes in the crustal structure, (5) prediction of natural disasters, and (6) disaster prevention technology. Furthermore, we also work on issues aimed at the formation of a sustainable society.

Educational field	Education and Research	Supervisors	Related lectures
Geological Science	We conduct education and research for unveiling the origins of underground resources and changes in the global environment during 4.6 billion years of the Earth history. The primary targets of our study are solid substances that record the Earth history such as minerals, rocks, and sedimentary strata. From the targets, we explore the material cycle, chemical reaction, heat history, and environmental changes of the Earth from its birth to the present on the basis of accurate age dating.	Prof. Yasuo Ishizaki Prof. Shin-ichi Sano Associate Prof. Ken-ichi Yasue Assistant Prof. Hikaru Sawada	Advanced volcanology Earth and life history Advanced neotectonics Advanced earth material science

Geophysics of Atmosphere, Ocean, and Cryosphere	As global warming progresses, extreme weather events are becoming more severe and frequent. The Hokuriku region is also affected by these significant climate changes, facing increased risks of various local disasters such as heavy snowfall, thunderstorms, heatwaves, and storm surges. To protect safe urban functions and rich social life from these risks, we aim to study the mechanisms behind climate system changes from a global perspective and develop highly capable individuals who can apply this knowledge to solve local problems.	Prof. Kazuaki Yasunaga Prof. Kazuma Aoki Prof. Konosuke Sugiura Prof. Bunmei Taguchi Prof. Masahiro Hori Associate Prof. Wataru Shimada Associate Prof. Atsushi Hamada	Advanced dynamic meteorology Advanced atmospheric radiation Advanced geoglaciology Advanced ocean and climate dynamics Advanced remote sensing Advanced snow and ice science Advanced atmospheric physics
Solid Earth Geophysics	Our education and research are aiming to advance our understanding of the structure of the solid Earth and its dynamics, especially around the Central Japan. We are investigating the crustal structure, seismic and volcanic activities, and environmental changes in this area through geophysical observations, field surveys, and laboratory experiments. Students are trained to contribute to the prediction, prevention and mitigation of natural disasters..	Prof. Tohru Watanabe Prof. Naoto Ishikawa Associate Prof. Kazuo Kawasaki Assistant Prof. Kohei Hotta	Advanced physics of the Earth's interior Advanced paleomagnetism and rock magnetism Advanced resource and environmental geophysics Advanced geodesy
Regulatory biology	Education and research are conducted on adaptive significance of biological rhythms and sleep system, endocrine system, and behavioral system of an individual organism or population in changing external environments.	Prof. Kouhei Matsuda Associate Prof. Tomoko Yoshikawa Lecturer Norifumi Konno Lecturer Tomoya Nakamachi Lecturer Eri Morioka	Advanced Biochemistry for Organic Molecules Advanced biological clocks Advanced endocrinology Advanced behavioral physiology Advanced invertebrate neuroethology
Life information science	We conduct education and research on molecular mechanisms of cell differentiation and organ development in higher plants, structure, and expression of plant genome. The perception and transduction of environmental signals such as light and hormones are also studied.	Prof. Ichirou Karahara Lecturer Masayuki Yamamoto Lecturer Daisuke Tamaoki	Advanced plant morphology Advanced plant molecular genetics Advanced plant cell biology
Living structure science	We analyze various processes in the biological developments, morphogenesis, structural features, phylogenetic relationships, diversity, behavioral ecology and evolution through comparative study in living structures. Thus, we conduct education and research to understand the fundamental principles and rules.	Associate Prof. Yuji Yamazaki Associate Prof. Kiyoto Maekawa Associate Prof. Tsutomu Tsuchida Assistant Prof. Kyouko Sato	Living structure science Advanced evolutionary developmental biology Advanced biology of symbiosis Advanced plant cytotaxonomy

Environmental and analytical chemistry	Our group focuses on exploring techniques from chemical approaches in solving and clarifying environmental problems. For example, we are developing simple and rapid analytical methods to measure harmful components related to environmental pollution. The dynamics of these components are then studied, and based on these findings, we perform basic research to remove the pollutants from waste water. Furthermore, our research also includes geochemical monitoring of CO_2 which consists of water rock interaction in geothermal fields. We also clarify and evaluate material cycling systems and mechanisms and changes in oceanic and terrestrial water systems, using major ions, trace elements, and stable isotopes.	Prof. Jing Zhang Prof. Hideki Kuramitsu Prof. Keiji Horikawa Lecturer Kazuto Sazawa Project Assistant Prof. Hidetaka Kobayashi Project Assistant Prof. Takanori Kagoshima	Advanced marine geochemistry Advanced water analysis Isotope studies in environmental science Advanced environmental water quality Advanced Ocean Dynamics Advanced Solid Earth Geochemistry
Environmental Biology	We conduct research on the functions of organisms, which are important components of the biosphere, from the molecular to ecosystem level. In particular, education and research will be conducted on the effects of environmental factors such as light, water, metal ions, and chemical substances on the physiological functions of organisms, the effects of global environmental change, and interactions between individual organisms and between species.	Prof. Daisuke Tanaka Prof. Hiroshi Ishii Associate Prof. Hiroyuki Kamachi Associate Prof. Kenji Kashiwagi Lecturer Akihiro Sakatoku Lecturer Tamihisa Oota	Advanced microbiology Advanced plant ecology Advanced plant physiology Advanced stratigraphy Advanced environmental molecular biology Advanced isotope ecology
Environmental Sustainability Science	From the perspective of the use and conservation of natural ecosystems, agricultural lands, plantations, and other green spaces, we will guide environmental sustainability research for Ph.D students.	Prof. Naoya Wada	Advanced Conservation Ecology

（4）Advanced Engineering Program

Education and research are conducted in the fields of mechanical engineering, electronics, robotics, materials science, and civil engineering to develop human resources with broad knowledge and specialized skills in engineering fields and the ability to solve problems in a sustainable society. Specifically, education and research will be conducted in the following fields and also aim at exchanges among the fields: a wide range of fields that integrate electronic and electrical engineering and mechanical engineering, with an understanding of natural sciences such as electromagnetism and various dynamics, the creation of a foundation for industrial and technological innovation through material innovation based on material science, and the design of safe, secure and comfortable cities through the advanced use of data science.

Educational field	Education and Research	Supervisors	Related lectures
Organic optoelectronic devices engineering	We conduct education and research in the optoelectronics, thin-film engineering, alignment controlling, and application of optoelectronic devices using organic semiconductors.	Prof. Shigeki Naka Associate Prof. Masahiro Morimoto	Advanced organic device Advanced organic thin films
High frequency engineering	We conduct education and research on mobile communication systems, regarding multipath radio propagation, adaptive signal processing using array antennas and its over-the-air testing method, and angle of arrival estimation.	Associate Prof. Kazuhiro Honda	Advanced radio wave propagation
Materials science for electronic devices	We conduct education and research on the nanodevices, MEMS (Micro Electro Mechanical Systems) and their integrated circuits, and the growth and characterization of semiconductor heteroepitaxial films. Crystal structure and dielectric properties of ferroelectric single crystals, ceramics, and thin film are also studied.	Prof. Masayuki Mori Associate Prof. Toshio Kikuta	Advanced semiconductor thin film technology Ferroelectric devices

Material design	We perform education and research on the relationship between electronic/atomic structure of materials and their mechanical/ physical properties. Emphasis is placed on the understanding deformation mechanism via advanced deformation method and the development of new functions via micro/nano-structure control, surface modification, or control of phase transformation/precipitation with metallic, ceramic, magnetic and superconducting materials. Electron microscopy, computational analysis and experimental techniques for physical transport properties will be introduced to proceed with the education and researches.	Prof. Kenji Matsuda Prof. Norio Nunomura Associate Prof. Takahiro Namiki Associate Prof. Seungwon Lee Assistant Prof. Taiki Tsuchida	Advanced nano material structural analysis Advanced computational materials modelling Transport properties of advanced materials Advanced strength of materials Advanced Materials Fabrication Engineering
Materials chemistry	Education and research are conducted into the fundamentals and applications of smelting, refining, and recycling processes of inorganic materials, mainly metals, by dry and wet methods and into the improvement of corrosion resistance, surface modification, and surface functionality by electrochemical methods.	Prof. Hideki Ono Associate Prof. Masahiko Hatakeyama	Advanced refining engineering of materials Advanced chemical analysis
Photofunctional Material	Education and research are conducted into the design and synthesis of new photofunctional materials based on surface-modified nanomaterials that enable hybridization with organic or inorganic materials so that they can be used in the development of artificial photosynthesis systems and applications in the field of nanomedicine.	Prof. Yutaka Takaguchi	Advanced photofunctional material
Material process	Various theories and technologies have been established in the creation and application processes of excellent new materials and functional materials, and in the molding of metals. Education and research are conducted on the industrial application of molecular functional materials.	Prof. Seiji Saikawa Prof. Tetsuo Aida Associate Prof. Takashi Hashizume	Advanced material forming and engineering Advanced material manufacturing and plasticity theory Advanced Hydrothermal Processing for Inorganic Materials
Materials for Biofunctionalizatio n	Education and research will be conducted into the design of artificial materials from the viewpoints of both macroscopic shape and microscopic material properties, not only to improve the functionality and performance of the material itself, but also to improve the functionality of the living body through the application of the material.	Prof. Takuya Ishimoto	Advanced Biomaterials Engineering
Transfer phenomenon system	We conduct education and research on transport phenomena of momentum, heat and mass occurring in industrial manufacturing processes such as polymer coating and alloy casting, aiming to develop mathematical models for simulation of unit operations constituting a process, methods for optimization of operating conditions, and technologies for saving energy and cost.	Associate Prof. Masamichi Yoshida	Theory of transport phenomena
Molecular mechanical engineering	We conduct education and research on molecular dynamics and quantum mechanics for new materials as well as on the evaluation of mechanical function and performance of molecular devices including electronic ones.	Prof. Takeshi Seta Lecturer Tatiana N. ZOLOTOUKHINA	Advanced Computational Thermo-Fluid Dynamics Advanced nano dynamics
Strength and fracture of engineering materials	We conduct education and research on establishment of optimal and safe design methods for mechanical components and structures. We also focus on creation and application of new functional materials through understanding the strength and fracture mechanisms of engineering materials, establishment of database for material properties, and reliability analysis.	Prof. Noriyasu Oguma Associate Prof. Koichi kasaba Associate Prof. Kenichi Masuda	Advanced mechanical engineering design for special environments Strength and properties of advanced functional materials Advanced nonlinear structural analysis

Function control engineering	The functions of high-speed, high-precision and complex systems range from non-bio to bio functions and have become subdivided. We conduct education and research to develop elements and systems for measurement. We also focus on control systems that can efficiently deal with high functionalization and multi-functionalization as well as establishment of the theories.	Prof. Tohru Sasaki Prof. Kenji Hirata Prof. Yoshiyuki Matsumura Prof. Toshiyuki Yasuda Associate Prof. Kenji Terabayashi Associate Prof. Junya Yamauchi Lecturer Masahiro Sekimoto	Advanced measurement system Decentralized and cooperative control systems Advanced intelligent system Advanced adaptive systems Advanced image measurement Advanced Learning-Based Control Advanced robot dynamics and control theory
Material processing	We conduct education and research on processing systems that not only improve the level of processing technologies and processing quality but also respond to superprecision and miniaturization by developing processing methods for new materials with multiple functions and elucidate their processing mechanisms.	Prof. Tomomi Shiratori Lecturer Noboru Takano	Advanced plasticity process Advanced microfabrication
Solid mechanics	On the basis of mechanics such as studies on the strength of materials, computational mechanics, and experimental mechanics, we perform education and research on the strength of new materials, their combined materials, and functional materials. We also carry out mechanical evaluation of machine, components, and structures.	Prof. Katsuyuki Kida Associate Prof. Koshiro Mizobe	Advanced solid Mechanics Advanced fracture mechanics
Intelligent systems	We conduct education and research on robotics, medical robotics system, rehabilitation systems, intelligent algorithms, and intelligent control.	Associate Prof. Hideki Toda	Biosignal measurement and processing for robot application
Bio-information engineering	We conduct education and research which promote design and development of the method of measuring biological information and the method of analyzing biological information for estimating a biological state.	qProf. Kazuki Nakajima	Advanced bio-instrumentation engineering
Computer applications engineering	We conduct education and research on human and traffic flow measurement for industrial applications using information sensing technology, human well being measurement technology using smart devices, QoE of multimedia applications/services, intellectual image processing for ITS, energy management system using IoT devices, construction DX technology.	Prof. Yuukou Horita	Advanced image communication
Ultra-high frequency engineering	We conduct education and research on electromagnetic simulation, device fabrication and measurement, and signal and image processing. Furthermore, we conduct education and research on imaging in the millimeter and terahertz wave regions.	Associate Prof. Tatsuo Nozokido Associate Prof. Masafumi Fujii	Advanced ultra-high frequency engineering Advanced FDTD analysis
Electric energy system	On the basis of high efficient power conversion and high voltage/current technologies, we conduct education and research on linear motor and actuator, magnetic levitation, magnetic bearing, power electronics, renewable energy utilization, pulsed power, high power pulsed particle beam, atmospheric pressure and high density plasma, and observation and projection of lightning discharge.	Prof. Hiroaki Ito Prof. Takahisa Ohji Associate Prof. Kenji Amei	High voltage and high current engineering Advanced electromagnetic engineering Advanced power conversion engineering

Thermofluid system	Our research in fluid and thermal sciences has both fundamental and applied studies in energy conversion, heat and mass transport, and technologies for their usage. Basic research efforts in energy systems include multiphase flows, coherent turbulent structure, and bioengineering.	Prof. Seiichiro Izawa Lecturer Atsushi Kase Lecturer Daisuke Watanabe	Turbulent flow and transport Advanced applied fluid engineering Advanced applied fluid engineering
Design Management	・Design excellence of public space and urban infrastructure from the perspectives of functionality and urban landscape ・Institutional capacity and governance (e.g., international comparative studies of public procurement systems) ・Revitalization of and community building in urban areas (e.g., residential living in the urban core, street audit and analysis)	Prof. Yoshiaki Kubota Assistant Prof. Yongcheng Wang	Advanced Design for Urban spaces
Hydraulic Engineering	We will elucidate the mechanisms and scenarios of various environmental problems and disaster prevention problems in rivers, coasts, and lakes. Furthermore, we will conduct education and research on measures to solve these problems from both hardware and software aspects.	Prof. Ichiro Kimura	Advanced River Hydraulics
Reliability design on geotechnical structure	Education and research of reliability design on geotechnical structure from the viewpoints, heterogeneous characteristics of natural ground, uncertainties of subsurface exploration and resistance evaluation of geotechnical structure, is conducted.	Prof. Takashi Hara	Special lecture of geotechnical structure design
Infrastructure Planning and Management	Education and research on the following points will be conducted. -Social impact assessment of public transportation development. -Methods of public participation in transportation and urban planning. Evaluation of its effectiveness. -Analyze the impact of disasters on transportation and propose countermeasures. -Evaluation of transportation nodes and pedestrian spaces.	Associate Prof. Hiroto Inoi	Advanced Urban and Transportation Planning
evaluation of structural performance	how to set the required performance, how to satisfy the required performance	Associate Prof. Tetsuya Kohno	Structural Design and Maintenance Engineering
Structural Mechanics and Bridge Engineering	We conduct education and research on structural mechanics and bridge engineering. In specific, with regard to steel, steel-concrete composite and fiber reinforced polymer bridge structures, the mechanical behavior of connection of members, the load carrying mechanism, the performance evaluation, the rational design and so on are studied.	Associate Prof. Yasuo Suzuki	Advanced Bridge Engineering
DX Design Science for Resilience	We conduct teaching and research on standardized methodology for design of resilient society from the perspective of disaster behavior science, such as standardized disaster management plans and manuals for rational response, technology of dynamic simulation for effective disaster response, and methodology of DX design for safe and secure society.	Associate Prof. Munenari Inokuchi	Advanced Risk Management