Admissions 2023

Fukushima University Graduate School of Symbiotic Systems Science and Technology (Doctoral Program)

◇ Major in Symbiotic Systems Science and Technology
◇ Major in Environmental Radioactivity

Application Guide

Applications for the Graduate School of Symbiotic Systems Science and Technology (Doctoral Program) will be submitted online from 2023 admissions.

Information in this guide (exam date, etc.) might be changed depending on the situation of COVID-19 spread. For the latest information, please visit the link below (Available only in Japanese).

Admission Information: http://nyushi.adb.fukushima-u.ac.jp/

国立大学法人
福島大学
Fukushima University

Admissions Office
1 Kanayagawa, Fukushima City,
Fukushima Pref., 960-1296
Phone: 81-24-548-8064
http://www.fukushima-u.ac.jp/

Fukushima University
Smartphone-friendly
Website

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The Doctoral Program of Fukushima University Graduate School of Symbiotic Systems Science and Technology consists of the Major in Symbiotic Systems Science and Technology and the Major in Environmental Radioactivity. The Major in Symbiotic Systems Science and Technology consists of two fields (Symbiotic Machines and System Intelligence and Symbiotic Environment Systems), and the Major in Environmental Radioactivity consists of one field (Environmental Radioactivity). Please refer to our website for more details of majors or fields.

< Graduate School of Symbiotic Systems Science and Technology >
https://www.sss.fukushima-u.ac.jp/en?lang=en

I. Application Guide for Fukushima University Graduate School of Symbiotic Systems Science and Technology (Doctoral Program)

1-1. Admission Policy (Student Acceptance Policy) for the Major in Symbiotic Systems Science and Technology (Doctoral Program)

○ **Educational Objectives and the Qualities Sought in Prospective Students**

The Major in Symbiotic Systems Science and Technology aims to develop individuals who can contribute to tackling challenges we are facing in the 21st century, such as the realization of a sustainable circular economy and development of countermeasures against the aging populations with a declining birthrate. In order to resolve these issues that have complex, multiple causes, there is a need for highly-skilled, global-minded professionals and researchers, who have acquired expertise and research capabilities in Natural Sciences, which was a leading study field of Graduate Schools in science and technology, and also knowledge of Human/Social Sciences.

This Major has a concept of "symbiotic relationships among human beings, industry, and the environment" as its philosophy, and offers research projects in the following two fields of specialization; Field of Symbiotic Machines and System Intelligence and Field of Symbiotic Environment Systems. Through its practical activities, the Major develops individuals capable of independently conducting and developing research activities. It aims to contribute to the world by creating and developing a human-centered systems science where the symbiotic relationships among human beings, industry, and the environment are fully considered, and by handing it down to future generations.

The objectives and characteristics of each Field of specialization are as follows.

[Field of Symbiotic Machines and System Intelligence]

In this Field, education and research activities shall be conducted on mechanical science, electronics science, control science, mathematics information science, computer science, management information systems, technology management, production management, as well as logistic systems. Through these educational activities, this Field develops independent professionals and researchers with outstanding skills of technology development and high level of research abilities which are essential to satisfy the needs of regional communities and to build engineering systems that can exist in a symbiotic relationship with humans in various fields of industry, such as, information communication systems (communication networks and software, etc.), mechanical systems (industrial robots, etc.) , medical and welfare systems, production systems, and transportation systems.

[Field of Symbiotic Environment Systems]

In this Field, education and research activities shall be conducted on functional materials, resource circulation, and energy technology. It develops independent professionals and researchers with a high level of research abilities. It develops skills in science and technology and a wide range of knowledge about the creation of industrial systems with a sustainable circular economy that can utilize regional characteristics. Furthermore, we provide resources to develop independent professionals and researchers with a variety of expertise:

Analysis and prediction skills which enable them to use a wide range of knowledge in the Field of environmental systems and various research methods, such as hygiene observations, modeling, and field surveys on ecological changes caused by water and material cycles

- Ability to use specialized skills in environmental preservation, purification of pollution, and environmental remediation in the spheres of atmosphere, water, geosphere, biosphere, and human society
- Ability to plan/manage sustainable social environment systems by evaluating the impacts of human activities utilizing environmental information
- Ability to elucidate the psychological mechanisms of humans by using a wide range of knowledge in Psychology, Physiology, and other fields related to that.

○ **Knowledge, Skills, and Will sought in Applicants**

To develop human resources who can contribute to tackling challenges that we are facing in the 21st century, such as the realization of a sustainable circular economy and development of countermeasures against the aging populations with a declining birthrate, we seek students or working persons who have the following knowledge, skills, and will to conduct studies and write a doctoral thesis in the subject groups mentioned in the curriculum policy.

- Basic knowledge and research experience acquired in a Master's Program of Graduate Schools in science and technology, which are necessary for the study in the Doctoral Program.
- Flexible thinking, the ability to quickly understand, the ability to apply knowledge, and the ability to express oneself.
- Enthusiasm to resolve concerns of modern society from the perspective of science and technology in cooperation with a variety of people with independent attitudes toward study and research.

○ **Basic Policy for Admission Selection**

Selection shall be based on a comprehensive evaluation of oral presentation, oral exam, and application documents, categorizing General Exam, Working Person Special Exam, International Students Special Exam, and Recommendation-based Exam (for students of advanced courses of technical colleges). In the oral presentation, applicants shall be asked to explain their graduation research during their undergraduate studies and their research after admission. Oral exam shall focus on basic and specialized matters related to the oral presentation and its content. Through the oral presentation and exam, the applicants shall be comprehensively evaluated on their knowledge, skills, and motivation, as well as on their ideal student as described above.

1-2. Admission Policy (Student Acceptance Policy) for the Major in Environmental Radioactivity (Doctoral Program)

○ **Educational Objectives and the Qualities Sought in Prospective Students**

Radionuclides present in the environment may change their forms and state due to atmospheric and water circulation and activities of humans and other organisms, and migrate widely in the environment. The factors that influence such change can vary significantly from the physicochemical properties of radionuclides to meteorological conditions, nature and properties of soils, physio-ecological processes of plants and animals, and so on. Studies on environmental radioactivity, therefore, require interdisciplinary knowledge drawn from a wide range of sciences, including ecology, biology, geoscience, mathematical modeling, chemistry, physics, mechanical engineering, and electrical engineering, as well as a holistic perspective and approach.

Human beings have experienced environmental releases of anthropogenic radionuclides due to atmospheric nuclear tests and accidents, but there are still many unresolved aspects of their effects. Another recent issue related to radiation is the need to control naturally occurring radioactive materials (NORMs) released during the extraction and processing of minor metals and other natural resources, which are indispensable materials for the development of advanced industrial products.

With these issues in the background, the Major in Environmental Radioactivity will select suitable human resources who have the will to 1) elucidate the environmental behavior of natural and anthropogenic radionuclides, 2) become able to perform the measurement, monitoring design, control, prediction, and evaluation in a comprehensive manner from a medium- to long-term perspective based on their expertise, 3) endeavor to meet challenges such as environmental protection, prediction and evaluation, environmental remediation, decommissioning, interim storage, decontamination, etc., and 4) contribute to the academic development of study fields of these issues. Selection will be based on an overall assessment of various skills, including basic academic skills necessary for the study, flexible thinking, analysis and observation skills, motivation for the study, and independent attitudes toward study and research.

This Major has one Field of specialization.

[Field of Environmental Radioactivity]

This Field develops human resources who endeavor to create human reassurance, safe society and environment by elucidating the mechanisms of dynamics of radioactivity in the environment, utilizing, deepening, merging, and developing their expertise.

○ **Knowledge, Skills, and Will sought in Applicants**

To develop professionals with practical ability to contribute to the region in the new academic framework of environmental radioactivity science, we seek students or working persons who have the following knowledge, skills, and will to conduct studies and write a doctoral thesis in the subject groups mentioned in the curriculum policy.

- Basic knowledge and research experience acquired in a Master's Program of Graduate Schools in science and technology, which are necessary for the study in the Doctoral Program.
- Flexible thinking, the ability to quickly understand, the ability to apply knowledge, and the ability to express oneself.
- Enthusiasm to resolve issues related to environmental radioactivity in cooperation with a variety of people with independent attitudes toward study and research.

○ **Basic Policy for Admission Selection**

Selection shall be based on a comprehensive evaluation of oral presentation, oral exam, and application documents, categorizing General Exam, Working Person Special Exam, International Students Special Exam, and Recommendation-based Exam (for students of advanced courses of technical colleges). In the oral presentation, applicants shall be asked to explain their graduation research during their undergraduate studies and their research after admission. Oral exam shall focus on basic and specialized matters related to the oral presentation and its content. Through the oral presentation and exam, the applicants shall be comprehensively evaluated on their knowledge, skills, and motivation, as well as on their ideal student as described above.

1. Number of Students to be Admitted

Major	Field		Number of Students to be Admitted
Major in Symbiotic Systems Science and Technology	Field of Symbiotic Machines and System Intelligence	I^{o} round	4
	Field of Symbiotic Environment Systems		
	Field of Symbiotic Machines and System Intelligence	II^{o} round	A few places available
	Field of Symbiotic Environment Systems		
Major in Environmental Radioactivity	Field of Environmental Radioactivity	I^{o} round	2
	Field of Environmental Radioactivity	II^{o} round	A few places available

* The number of students to be admitted is the total number of students admitted through General Exams and Working Person Special Exams.
* No limit is set to the number of students for each field.

2. Application Qualification

(1) General Exam

A person who falls under any of the following items qualifies for the General Exam.

1) A person who has been conferred a master's degree or a professional degree, or is expected to be conferred by March 31, 2023.
2) A person who has been conferred a master's degree or a degree equivalent to a professional degree in foreign countries, or is expected to be conferred by March 31, 2023.
3) A person who has been conferred a master's degree or a degree equivalent to a professional degree, or is expected to be by March 31, 2023, by taking correspondence courses offered by foreign schools in Japan.
4) A person who has been conferred a master's degree or a degree equivalent to a professional degree by completing a graduate course at an educational institution located in Japan that is recognized by the educational system of a foreign country and is separately designated by the Minister of Education, Culture, Sports, Science and Technology, or is expected to be conferred by March 31, 2023.
5) A person who has been conferred a degree equivalent to a master's degree or is expected to be conferred by March 31, 2023, by completing a course of United Nations University that has been founded based on a United Nations General Assembly resolution dated December 11, 1972 as stipulated 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).
6) A person who has completed an educational program at a foreign school, a designated academic institution as described in item 4) above, or United Nations University, and has passed an exam or a screening equivalent to those outlined in Article 16-2 of the Standards for Establishment of Graduate Schools, and has been recognized as having equivalent or superior academic ability to that of a person with a master's degree.
7) A person who has graduated from a university and has research experience of more than 2 years at universities or institutions, etc., and has been recognized by the Graduate School of Symbiotic Systems Science and Technology based on the research achievements from the period after the graduation as having equivalent or superior academic ability to that of a person with a master's

degree or a professional degree.

8) A person who has completed 16 years of school education in foreign countries, or in Japan by taking correspondence courses provided by foreign schools, and has research experience of more than 2 years at universities or institutions, etc., and have been recognized by the Graduate School of Symbiotic Systems and Science based on the research achievements from after the graduation as having equivalent or superior academic ability to that of a person with a master's degree or a professional degree.
9) A person who is recognized by the Graduate School of Symbiotic Systems Science and Technology as having equivalent or superior academic ability to that of a person with a master's degree or a professional degree, as a result of an individual enrollment qualification assessment, and reaches the age of 24 by March 31, 2023. (A person who was born on April 1, 1998 is included.)

(Note)
A person who intends to apply under the application qualification items 6), 7), 8), or 9) must take an individual enrollment qualification assessment. Enter the necessary matters in the Application Form prescribed by the University and submit at least one month before the application for the entrance exam, with the required documents.
For the necessary documents for application, inquire with the Admission office of the University or refer to the "Entrance Exam Information" on the website of the University.
http://nyushi .adb.fukushima-u.ac.jp/ (Available only in Japanese)

(2) Working Person Special Exam
A person who falls under any of the application qualifications for "(1) General Exam" and also either of the following application qualifications.

① A person who is employed by a company or a public agency, etc. at the time of application.
② A person who is not employed by a company or a public agency, etc. at the time of application, but more than 2 years have passed since the acquisition of a master's degree or a professional degree.

3. Application Procedure

◎ Before applying, please be sure to contact the instructor you wish to serve as your supervisor and discuss your suitability for the field of study.

If you do not know how or whom to contact, please notify the Admissions Office of the University (email: nyushi@adb.fukushima-u.ac.jp).

※The Internet application site is only available in Japanese. If you have difficulty using the site in Japanese, the university will provide assistance with the Internet application. Please contact us by email (ier@adb.fukushima-u.ac.jp)

(1) Check the Application Method (Step 1)

For details on the application procedure, please refer to the "Entrance Exam Information" posted on the university's website, (http://nyushi.adb.fukushima-u.ac.jp/) and the following

The application procedure is not completed only with the "Internet Application Registration (Step 2 below)".

Step 1	Check Application Method (See page 6-7)	Before you start the application procedure, please read this Application Guide carefully and confirm its contents.
▼		
Step 2	Internet Application Registration (See page 8)	During the application registration period, please access the Internet application site and enter the required information.
▼		
Step 3	Payment of exam fee (See page 8)	Follow the instructions on the Internet application site to pay exam fee.（Do not pay if you are applying for an exam fee exemption.）
▼		
Step 4	Preparation of necessary documents, Printing and sending (See page 8-10)	Please send the required documents printed from the Internet application site or the University website and all other required documents to the University by registered express mail so that they reach the University by the end of the application period.
▼		
Step 5	Printing Exam Admission Slip (See page 10)	Once your application has been accepted, you will be able to print out your Exam Admission Slip from the Internet application site after the application period is over. Each applicant must print the Exam Admission Slip in color. Be sure to bring it with you on the day of the exam.

(2) Preparation in Advance (Step 1)

Please check and prepare well in advance of registering your online application.	
Preparation of PCs, etc.	Online applications must be processed under the following environment. <Windows> ・Microsoft Edge（Latest Version） ・Google Chrome（Latest Version） ・Firefox（Latest Version） <Mac OS> ・Safari（Latest Version） <Android 5.0 or higher > ・Android Chrome <iOS 10.0 or higher > ・Safari ※Please note that the site can be used even if the browser us not the latest version, but it may not work properly. In such cases, please update to the latest version.
Email Address Preparation and Email Setup	An email address is required for application, so please have it ready in advance. Smartphone and cell phone email addresses are also accepted. If you have set up a domain name filter, please add the following domains to your settings so that you can receive emails from these domains. **（@adb.fukushima-u.ac.jp，@postanet.jp）** The following emails will be sent to the email address registered at the time of application. ① Test email while entering online application registration ② Automatic email upon completion of application registration information ③ Automatic email upon completion of payment of exam fee (No email when exam fee is exempted.) ④ Email when your facial photo is approved or disapproved ⑤ Email when Exam Admission Slip becomes available and printable ※Do not change your email address until you print your Exam Admission Slip.
Preparation of applicant's photo (data)	A color facial photo (jpg) is required for online application registration.（Your facial photo will appear on Exam Admission Slip.） As it will be used for identification purposes, upload a clear facial photo on the Internet application site, facing front, upper body, hatless, without a background, and taken within three months prior to the application date. Photo size should be 4 cm (H) x 3 cm (W) and the file size should not exceed 3 MB. Please note that the application may not be accepted if the photo is not suitable for identification, such as those listed below [Examples of photos that may not be used] Difficulty in identification because of unclear, dark background, face turned sideways, makeup or bangs over the eyes, etc., multiple people in the photo, altered image, **re-photographed photo (taking a photo of an already developed photo)** etc.
Preparation of necessary documents, etc.	Please prepare the documents listed on “Applications Documents”（See page 9.） in advance so that they will be ready in time for the application period.
Preparation of an envelope	Please prepare a commercially available kakugata 2 envelope (240mm x 332mm) or similar size envelope for submitting the application documents.
Preparation for printing forms (Printer, printing paper, etc.)	Forms printed from the Internet application site must be printed in color on A4 size paper, so please prepare a color printer and printing paper. You may use the printing services of public facilities or convenience stores to print your documents as long as they meet the printing requirements, but please be careful with your personal information. Applicants may be contacted if the printing is unclear and cannot be verified.

(3) Online Application Registration Period (Step 2)

Iº round	**Wednesday, July 13, 2022 - Thursday, July 21, 2022, 4:30 p.m. in JST**
IIº round	**Sunday, October 30, 2022 - Monday, November 7, 2022, 4:30 p.m. in JST**

(4) Payment fee (Step 3)

Exam fee is **30,000 yen**. Please refer to the payment method on the Internet application site, and pay by “credit card”, “convenience store”, or “Pay-easy (Internet banking or bank ATM)”. (A separate payment fee is required.)

* Applicants who are expected to complete the Master's Program of Fukushima University in March 2023 do not need to pay the application fee.

[Payment period]

Iº round	**Wednesday, July 13, 2022 - Thursday, July 21, 2022, 4:30 p.m. in JST**
IIº round	**Sunday, October 30, 2022 - Monday, November 7, 2022, 4:30 p.m. in JST**

Payment is due within four days from the date of completion of the online application registration. (If the application deadline comes shorter than 4 days, payment is due on the application deadline.)

Exam fee shall not be returned for whatever reasons after the application documents are received except for the following cases:

a. The applicant paid exam fee but did not complete the application (did not submit application documents or the application documents were not received)

b. The applicant mistakenly made a double payment of exam fee.

c. The applicant obtained supporting documentation that certifies your eligibility for exam fee exemption after the application period.

Procedure for refund application shall be notified individually.

For inquiries regarding the refund of exam fees: Financial Affairs Division, Accounting section

Phone: 024-548-8015

*Exam fee exemption

In order to reduce the financial burden of those affected by the Great East Japan Earthquake, TEPCO's Fukushima Daiichi Nuclear Power Plant accident, and the severe disasters such as the heavy rain fall in and after FY2011, and to ensure opportunities for those affected to pursue higher education, the University will offer special measures to exempt exam fee for all entrance exams in FY2022.

For the conditions of the exemption, please refer to "13. Exam Fee Exemption for Those Affected by the Great East Japan Earthquake (Including the Nuclear Power Plant Accident) and Other Serious Disasters" on page 13.

Please do not pay exam fee at the time of application if you would apply for exam fee exemption.

(5) Application Period (Step 4)

Iº round	**Friday, July 15, 2022 - Thursday, July 21, 2022, 5:00 p.m. in JST**
IIº round	**Tuesday, November 1, 2022 - Monday, November 7, 2022, 5:00 p.m. in JST**

(6) Submission of Application Documents (Step 4)

Fukushima University Admissions Office

1 Kanayagawa, Fukushima City, Fukushima Prefecture, 960-1296 Phone: +81-24-548-8064

(7) Application Documents (Step 4)

Applicants shall prepare the following application documents and must submit them directly or send by ordinary registered express mail. If delivered after the application period, the application cannot be accepted. Please send it ahead of time, fully considering the period required for mailing.

However, only ordinary registered express mail postmarked by the originating office on the day before the last day of the application period specified in the item (5) will be accepted even if it arrives after the deadline. **Ordinary registered express mail postmarked by the sending office on the last day of the application period will not be accepted**. (This is because it is certain that the documents will not arrive at the University within the application period.)

If you bring your application, the Admissions Office is open from 9:00 a.m. to 5:00 p.m. on weekdays.

Application Documents

Documents required for application	Targeted persons	Remarks
1) Application Form (◆)	All Persons	University designated form Please fill out the required information.
2) Academic Performance Certificate	Al persons	Issued by the president of the University of graduation or the dean of the Graduate School. (Copies are unacceptable)
3) Certificate of (expected) Graduation	All Persons	Issued by the president of the University of graduation or the dean of the Graduate School. (Copies are unacceptable)
4) Master's Thesis, etc.	**(A) Persons who are expected to complete a Master's Course or to be conferred a Master's Degree**	**・Research Outline** Write a summary of your ongoing research, including the prediction of its result (up to five pages of A4 paper).
	(B) Persons who have completed a Masters Course or have conferred a Master's Degree	**・A copy of your Master's Thesis** **・An abstract of your Master's Thesis** Write an abstract of your Master's Thesis (up to five pages of A4 paper). If you have any research papers, abstracts, or patent certificates related to your Master's Thesis, submit a copy of them.
	(C) Persons who do not fall under (A) or (B) above	**・Research Outline** Write a summary of your past research results (up to five pages of A4 paper).
5) Research Plan	All Persons	Write about your future research theme, purpose, and its concept (up to five pages of A4 paper).
6) Performance Certificate of English Proficiency Test	Persons who wish to be exempt from the Academic Test	Persons who have obtained a score of 550 or higher of either of the following English proficiency tests shall be exempted from the Academic Test. TOEIC Listening & Reading Test (Open Test) TOEIC Listening & Reading IP (Including College TOEIC) The Scores shall be those acquired by the test taken during the period from two years before the date of entrance exam to the date of application. TOEIC Official Score Certificate or Score Report shall be submitted for performance certificate.
7) Research Results Report (◆)	Working Person Special Exam Applicants	Enter the research results and employment history, etc.
8) Documents proving current employment	Working Person Special Exam Applicants	A person falling under application qualification (2) (A) shall submit the documents certifying that the person is employed (a copy of employee ID, health insurance certificate, or wage statement, etc.)
9) Application Form for Exam Fee Exemption (◆) and Documents to be Attached	*Applicants only	University designated form If you wish to apply for exam fee exemption, please do not pay exam fee at the time of application.
10) Envelope for submitting application documents	All persons	Please prepare a commercially available kakugata 2 (240mm x 332mm) envelope or similar size envelope, enclose the required documents applicable to you from 1) – 8) above, and send by ordinary registered express mail.
11) Address sheet (◇) for submission of application documents	All persons	Please print an address sheet in color from the Internet application site and glue it to the front side of the "9) Envelope for submitting application documents". Enclose the necessary application documents and mark the applicant' checklist on the address sheet to make sure that nothing is missing.

(8) Notes on Application Documents (Step 4)

① Documents marked with (◇) in the table are to be printed in A4 size in color from the Internet application site after registering the online application. Please note that once you have completed the online application registration, you will not be able to correct any of the information you have entered.

② Documents marked with (▨) in the table are to be printed in A4 size in black and white (double-sided printing in the case of multiple pages) from the University's website.(Exam Information - Application Guide on the University's website, https://www.ier.fukushima-u.ac.jp/web/d_education_exam_e.html) Please use a black or blue ballpoint or fountain pen and write in block style. Documents not designated to be handwritten may be prepared on a computer.

③ Certificates (“2. Academic Performance Certificate”, “3. Certificate of (expected) Graduation”) written in languages other than Japanese must be accompanied by a Japanese translation.

④ The abstract and research outline of the “4. Master's Thesis, etc.”, and “5. Research Plan” should be written in Japanese.

⑤ Application Forms that do not have all the necessary documents attached by the due date shall not be accepted.

⑥ Changes to the documents shall not be permitted for any reason after completion of the application procedure.

⑦ If any fact different from the stated matters in the application documents was discovered, admission might be revoked even if the admission was approved.

⑧ 5) Performance Certificate of English Proficiency Test will be returned on the day of exam after the Admissions Office photocopies it. However, if you want to have it returned by mail, please prepare a "return envelope" by yourself, put a stamp on it, and enclose it with your application documents.

(9) Printing Exam Admission Slip (Step 5)

Exam Admission Slip can be printed from the Internet application site after the application period is over. Please print it in color, cut it with scissors along the cut line, and **bring it with you on the day of exam**. Email will be sent to email address registered at the time of application, informing you that you can now print Exam Admission Slip. Even if you do not receive an email from your provider, please log in to the Internet application site at least 3 days prior to exam date to print Exam Admission Slip.

4. Selection Method

(1) General Exam

- In the General Exam, selection shall be made by comprehensively considering the result of the Academic Test (except for those with a TOEIC score of 550 or higher), oral presentation and oral exam, and application documents.
- In the Academic Test, questions to check your English proficiency and technical vocabulary skills in your research field shall be asked in the form of oral questions and answers.
- In the oral presentation, applicants shall describe their past research achievements (Master's Thesis, etc.) and the details of their research plan after admission, within 15 minutes. Bring three copies of presentation materials, comprising a maximum of five pages of A4 paper, hand them over the interviewers, and explain mainly using the materials. If necessary, you can use devices for supplementary explanations (for example, you may use the PC for playing motion pictures and for executing demonstration software) by bringing them in. However, you cannot use a screen or a projector.
- In the oral exam for the Major in Symbiotic Systems Science and Technology, questions on the oral presentation, and basic and specialized matters related to the presentation shall be asked.
- In the oral exam for the Major in Environmental Radioactivity, questions on the presentation, and basic and specialized matters related to the presentation shall be asked. In addition, questions to check your English proficiency and technical vocabulary skills in your research field shall also be asked.

(2) Working Person Special Exam

- In the Working Person Special Exam, selection shall be made by comprehensively considering the result of the oral presentation, oral questions and answers, and application documents.
- In the oral presentation, applicants shall describe their past research results (Master's Thesis, etc.), research achievements, and the details of their research plan after admission, within 15 minutes. Bring three copies of presentation materials, comprising a maximum of five pages of A4 paper, hand them over the interviewers, and explain mainly using the materials. If necessary, you can use devices for supplementary explanations (for example, you may use the PC for playing motion pictures and for executing demonstration software) by bringing them in. However, you cannot use a screen or a projector.
- In the oral questions and answers on research, questions on the presentation, and basic and specialized matters related to the presentation shall be asked.

5. Exam Schedule and Venue

(1) Exam Schedule

【I° round】

Category	Exam Date	Exam Method
General Exam	**Friday, August 19, 2022** Meeting times will be announced in the "Exam Information" page on the University's website at least one week prior to the exam date.	Academic Test Oral presentation/Oral exam
Working Person Special Exam		Oral presentation/Oral exam

【II° round】

Category	Exam Date	Exam Method
General Exam	**Saturday, November 26, 2022** Meeting times will be announced in the "Exam Information" page on the University's website at least one week prior to the exam date.	Academic Test Oral presentation/Oral exam
Working Person Special Exam		Oral presentation/Oral exam

(2) Exam Venue

Fukushima University (1 Kanayagawa, Fukushima City)

*Refer to the Information Map of the University at the end of this guide.

For details on the exam site, etc., please refer to the information on the "Exam Information" page (http://nyushi.adb.fukushima-u.ac.jp/) on the University's website.

6. Preliminary Consultations for Applicants with Disabilities

Applicants with illnesses, injuries, disabilities, etc. who need special consideration for taking exam and after admission shall notify Admissions Office at least one (1) month before the application.

7. Security Export Control

The University conducts security export control based on the "Foreign Exchange and Foreign Trade Law" to ensure that the content of education and research provided to international students does not interfere with the maintenance of international peace and security. Please note that the University may request changes in the content of the education / research you wish to pursue.

For details, please contact the Research Promotion and Regional Collaboration Division (+81-24-548-5248).

8. Announcement of Successful Applicants

I° round	**Thursday, August 25, 2022, 11:00 am in JST**
II° round	**Thursday, December 8, 2022, 11:00 am in JST**

To announce successful applicants, examinee numbers will be posted on the "Exam Information" page of the University website (http://nyushi.adb.fukushima-u.ac.jp/), and "Letter of Acceptance" will be sent by postal mail or email to the successful applicants.

We will not answer inquiries about exam results by telephone, etc.

Please note that it may be difficult to connect to the Internet on the day of the announcement of successful applicants due to congestion in the Internet network line.

9. Enrollment Procedure and Matters of Note for Enrollment Procedure

(1) Successful applicants shall complete the enrollment procedure during the following period by post. The details will be stated in the "Guide for Enrollment Procedure" to be sent to successful applicants.

Period for enrollment procedure:

Friday, December 9 to Friday, December 16, 2022, 4:00 p.m. in JST

*If the applicant has not completed the enrollment procedure by the designated date, the applicant will lose the rights of a successful applicant.

*"Guide for Enrollment Procedure" starting with the enrollment procedure and membership fees, etc. shall be sent **for the successful applicants in early October for I° round and in mid-December for II° round.**

(2) Admission and Tuition Fees

Admission Fee	282,000 yen [as of now]
Tuition Fee	
First Semester	267,900 yen [as of now]
Second Semester	267,900 yen [as of now]
Annual amount	535,800 yen [as of now]

(Note)

(1) Applicants who are currently studying in a Master's Program of Fukushima University and are expected to complete the program in March 2023 shall be exempted from the Admission Fee.

(2) If the admission and tuition fees are revised at the time of admission or during enrollment, the new admission and tuition fees shall be applied from the time of revision.

(3) After completion of the enrollment procedure, if you decline admission due to special circumstances, please submit the "Admission Declination Form" (in a discretionary form) by March 31, 2023. Provided, however, that the admission fee shall not be returned. This includes the case where the applicant cannot satisfy the admission qualifications owing to repeating a school year, etc.

10. Reduction or Exemption of Admission and Tuition Fees

Students who have difficulties in paying Admission or Tuition Fees due to financial reasons and who are recognized as having outstanding academic capabilities may be exempted from the fees or permitted to pay deducted amount of the fees after going through a screening process.

In addition, we offer a special system of Tuition Fee exemption (all or part) for the following fiscal year of the application, for students of the Doctoral Course who are recognized as having outstanding academic capability or excellent research achievements, after going through a screening process. If the application for the special exemption is approved for students enrolling in April 2023, they shall be exempted from the Tuition Fee for FY2023.

For more details of reduction or exemption of admission and tuition fees, refer to the "Guide for Enrollment Procedure" to be issued to successful applicants.

Contact: Student Affairs Division Phone: +81-24-548-8060

11. Matters of Note

(1) Application procedure and exam date, etc. are subject to change depending on the situation. If there is any change, updated information shall be provided for all applicants.

(2) Personal information of applicants

The University will obtain personal information of applicants from the submitted application documents and entrance exams. Obtained information shall be kept confidential and used only for the following purposes in compliance with Act on the Protection of Personal Information Held by Independent Administrative Agencies and the personal information protection regulations of Fukushima University.

○Use for operations of selecting applicants for admission (including procedures, such as statistical processing)

○Use for the Enrollment Procedure

○For the person who completed the enrollment procedure, we will use personal information for operations on instructions for study, student support, improvement of education, and collection of tuition fees after enrolling. For those who are exempt from admission and tuition fees and/or who applied for scholarships, results of the entrance exam, etc. shall be used for selection and determination of persons to be exempt and receive scholarships.

In order to facilitate the application process, the University outsources some of its operations. In this case, we provide necessary personal information to the subcontractor, but we supervise the subcontractor appropriately, for example, by concluding a contract with the subcontractor regarding the appropriate handling of personal information.

(3) Contact for Entrance Exam

Fukushima University Admissions Office Phone: +81-24-548-8064

12. Exam Fee Exemption for Those Affected by the Great East Japan Earthquake (Including the Nuclear Power Plant Accident) and Other Serious Disasters

In order to reduce the financial burden of those affected by the Great East Japan Earthquake, TEPCO's Fukushima Daiichi Nuclear Power Plant accident, and the severe disasters such as the heavy rain fall in and after FY2011, and to ensure opportunities for those affected to pursue higher education, the University will offer special measures to exempt exam fee for all entrance exams in FY2022.

(Note: Please do not pay exam fee at the time of application if you would apply for exam fee exemption.)

(1) Eligible Person

An applicant for the University this year, who was recognized as falling under any of the categories below, is eligible for exam fee exemption.

1) A person who suffered damages in the area to which the Disaster Relief Act shall apply, which was designated in the Great East Japan Earthquake or a person who suffered damages by the disasters designated as "disasters of extreme severity" after FY2011, whose house the person or the major household income earner resided was certified as having fallen victim to full destruction, large-scale half destruction, half destruction, or flown out.

2) A person who was damaged in the area to which the Disaster Relief Act shall apply, which was designated in the Great East Japan Earthquake, or a person who suffered damage from the disasters designated as "disasters of extreme severity" after FY2011, whose major household income earner died or disappeared.

3) Those who resided or whose major household income earner resided in the "evacuation order zone (warning zone)," "planned evacuation zone," "emergency evacuation preparation zone," "specific spots recommended for evacuation," as of March 11, 2011, which were established after Tokyo Electric Power Company's Fukushima Daiichi Nuclear Power Plant accident, and who needed to evacuate in connection therewith.

For the details of the above exemption, see the table below.

<table>
<tr><td>Category</td><td colspan="5">Approval of exam fee exemption (Approval:○, Disapproval:×)</td></tr>
<tr><td rowspan="2">1) Total or half destruction of the house</td><td>Total destruction</td><td>Half destruction in a large scale</td><td>Half destruction</td><td>Flown out</td><td>Partial destruction</td></tr>
<tr><td colspan="4">○</td><td>×</td></tr>
<tr><td rowspan="2">2) Major household income earner died or disappeared</td><td colspan="4">Major household income earner</td><td>Other than major household income earner</td></tr>
<tr><td colspan="4">○</td><td>×</td></tr>
<tr><td rowspan="2">3) Impact by the nuclear power plant accident</td><td>Evacuation order zone (warning zone)</td><td>Planned evacuation zone</td><td>Emergency evacuation preparation zone</td><td>Specific spots recommended for evacuation</td><td>Other areas</td></tr>
<tr><td colspan="4">○</td><td>×</td></tr>
</table>

Note: Zones are the ones before the reorganization.

(2) Required Documents

An application for exam fee exemption, the following documents are required.

1) Application form for exam fee exemption (designated form attached hereto)

2) A copy of any one of the certificates set forth below:

If falling under (1)-1) above, "disaster victim certificate issued by the head of municipalities."

If falling under (1)-2) above, "document certifying the death or disappearance of the major household income earner."

If falling under (1)-3) above, "document certifying that the person is (was) under evacuation" (self-claiming document is acceptable).

(3) Submission Method and Period of Required Documents

Submit them together with application documents during the application period.

In this regard, if the application for exam fee exemption is made, do not pay exam fee at the time of application.

13. Response to COVID-19 for the Entrance Exam

1. Alternative Exam Arrangements

Those who made an application to the entrance exam of the Graduate School of Symbiotic Systems Science and Technology (Doctoral Program) to be conducted in FY2022 (hereafter, 'examinee') and are not able to take exam due to the following COVID-19-related reasons may request for an alternative exam opportunity.

(1) Target

① Examinee who was infected with COVID-19 and has not been confirmed by a doctor that he/she has recovered by exam day.

② Examinee specified by the Regional Health Center that he/she is a close contact of someone tested positive*.

*Examinee who has been specified as a close contact but has no symptom may be allowed to take exam in a separate venue. (Refer also to 2. COVID-19 Response to the Close contacts with No Symptom.)

③ Examinee who has suspected symptoms such as body temperature of 37.5 degrees or higher, cough, etc., on exam day.

(2) Application Period
A day before exam and the day of exam (9:00 a.m. to 5:00 p.m.)

(3) Application Procedure
A) Examinee or a representative shall bring over the 'Exam Admission Slip,' a 'Medical Certificate (or an equivalent document)' that includes the medical treatment period and body temperature, and a filled-up application form for the alternative exam opportunity during the application period indicated below.
B) If neither examinee nor the representative can bring over the documents during the application period, a tentative application can be made over the phone. However, it is required to submit the 'Exam Admission Slip' and 'Medical Certificate (or an equivalent document)' by the following day of exam.
(Note) If it falls on Saturday or Sunday, the due date shall be replaced with Monday. If Monday falls on a national holiday, the due date shall be replaced with Tuesday.

(4) Approval to the Request for an Alternative Exam
Whether or not the application is approved shall be notified to each examinee.

(5) Alternative Exam Schedule and Venue
① The University shall specify alternative exam day/time.
② Venue of the alternative exam shall be the same as the original exam.

(6) Announcement of Successful Applicants and Enrolment Procedure
Those shall be notified individually to each alternative examinee.

2. COVID-19 Response to the Close Contacts with No Symptom
If an examinee identified by the regional healthcare center as a close contact of someone who tested positive meets all the following conditions, he/she may request the Admissions Office for an exam in a separate venue on the original exam day. If that is the case, consult as soon as possible with the Admissions Office by phone, in principle, by 10:00 a.m., two days before exam.

< Requirements to Take Exam >
① The result of the initial screening (PCR or other tests (administrative tests) conducted by the municipality or by a medical institution directed by the municipality) must be negative.
* Until the results of the initial screening test are known, the applicant will not be allowed to take the exam, and will be required to take an alternative exam.
* However, examinees from municipalities where administrative testing is not available may take exam if they meet the requirements of ② and ③ after negative confirmation using an antigen qualitative test kit, if possible.
② Be able to come to the venue by a private car so that he/she can avoid using public transportation (trains, buses, or taxis) and crowded places.
③ Have no symptom on the day of exam

(Note)
① When the request for an alternative exam is approved, the Admissions Office shall confirm the examinee's intention and send a 'permit' by email or post.
② On the alternative exam day, bring the 'permit' to the venue. Venue and meeting time shall be specified by the University, and notification shall be sent along with the 'permit.' At the meeting place, the University shall confirm if he/she has no symptoms.
When the examinee meets all requirements mentioned above, he/she shall be allowed to take exam in a separate venue with adequate preventive measures against COVID-19 infection. If the examinee has a fever or cough, etc., he/she shall not be allowed to take the alternative exam.

3. Requests to All Examinees

The University shall conduct the entrance exams taking adequate preventive measures against infection. All examinees are requested to take preventive measures against COVID-19 stated below.

<Until the Day of Exam>

- Manage your daily health conditions and avoid the risk of infection, such as avoiding non-essential outings, etc.
- Examinees who meet either of the following conditions shall not be allowed to take exam:
  - Those who were infected with COVID-19 and not yet recovered
  - Those who have been identified by a regional health center as a close contact of someone tested positive and have suspected symptoms (For close contacts with no symptom, refer to 2. COVID-19 Response to the Close Contacts with No Symptom)

<Exam Day>

- Make sure that your body temperature is lower than 37.5 degrees. If not, refrain from taking exam.
- Make sure to wear a mask in the venue except when the photo collation is processed.
- Wash your hands after using the restroom.
- Disinfect your hands with an alcohol-based sanitizer.
- If you feel unwell during exam (fever, cough, etc.), contact exam supervisors.
- Exam room will be ventilated, so please bring clothing that can regulate your body temperature.
- Refrain from contact and conversation with others as much as possible before exam and during breaks.
- Wear a mask and refrain from talking with your friends on the train etc., during travel to exam.

<After Exam>

- If you got infected with COVID-19 within one week after the exam, make sure to report it to the University Admissions Office.
- If any infected person is identified at the exam venue, the University may provide the regional health center with the contact information, etc., of examinees. The information shall not be used for any purpose other than preventing of COVID-19 spread.

※Furthermore, depending on the status of further COVID-19, response to COVID-19 for the entrance exam in 2023 may be changed. If response is changed information will be updated on our website as appropriate. (Information on entrance exams: http://nyushi.adb.fukushima-u.ac.jp/)

II-1. Features of the Major in Symbiotic Systems Science and Technology (Doctoral Program)

1. Organization and Basic Philosophy of Educational Programs

The Major in Symbiotic Systems Science and Technology (Doctoral Program) aims to realize a sustainable circular economy based on the concept of "symbiotic systems science." The Major provides a variety of specialized education to equip students with a high level of research capability and a wide range of knowledge that forms the basis thereof, which enable them to conduct research activities independently in their own fields, toward resolving the issues of the 21st century.

In order to clearly define the objectives of specialized learning, it promotes research and education in the following two distinct fields of study: Field of Symbiotic Machines and System Intelligence, Field of Symbiotic Environment Systems. Furthermore, to promote better coordination between the needs of regional society and education at the Graduate School, the Major aims to develop professionals with practical research capability that can benefit the regional society. Therefore, it offers an educational system where students can conduct on-site development and verification experiments to actively tackle regional concerns, in cooperation with other institutions and companies in Fukushima Prefecture.

2. Requirements for Completion, Class Attendance, and Conferment of the Degree

For those who study at the Graduate School for three years or longer and satisfy the following requirements for completion, "Doctoral Degree in Science and Engineering" will be conferred.

(Requirements for Completion and Class Attendance)

Complete 20 credits in total, including 18 credits of compulsory class subjects and 2 credits of elective class subjects, and successfully defend the Doctoral Thesis.

3. Class Subjects and Credits to be Offered

Class Subjects and Credits to be Offered Graduate School of Symbiotic Systems Science and Technology **Major in Symbiotic Systems Science and Technology (Doctoral Program)**					
Subject Type	Subject Name	Year	Credits		Remarks
			Compulsory	Elective	
Common	(Common Subject A)				
	Advanced Seminar in Symbiotic Systems	1	2		
	(Common Subject B)				
	Practical Training in Symbiotic Machines and System Intelligence	2		2	
	Practical Training in Symbiotic Environment Systems	2			
Specialized	Advanced Seminar in Symbiotic Systems Science I	1	2		
	Advanced Seminar in Symbiotic Systems Science II	2	2		
	Advanced Seminar in Research Practice I	1	2		
	Advanced Seminar in Research Practice II	2	2		
	Advanced Practical Training in Symbiotic Machines and System Intelligence	3	2		
	Advanced Practical Training in Symbiotic Environmental Sciences	3			
Advanced Research	Advanced Research on Symbiotic Systems Science	1-3	6		

4. List of Instructors Eligible to Serve as Supervisors of Advanced Research on Symbiotic Systems Science (Some instructors might be changed.)

【Field of Symbiotic Machines and System Intelligence】

Name	Laboratory name	Research Content
BAMBA Kazuharu	Cosmology	Study of cosmology and astrophysics based on general relativity, quantum field theory and particle physics, and gravitational theories
DONG Yanwen	Management Information System Engineering	Application of data science and artificial intelligence technology for enterprise management, and development of management information system
FUJIMOTO Katsushige	Evaluation and Decision Making	Mathematical science and informatics for evaluation and decision making processes
FUTAMI Ryoko	Laboratory of Human Information Processing	Study on human information processing, including psychophysical understanding of neural systems and developing human support systems for impairments in sensory and motor functions
HIGUCHI Yoshiyuki	System Modeling and Simulation	Modeling, simulation, analysis, optimum design and operation for logistics, production and social infrastructure
ISHIKAWA Tomoyasu	Logistics Systems	Study based on planning method related to physical distribution and logistics including vehicle routing, facilities location planning, and inventory planning
ISHIOKA Masaru	Innovation and Technology Management	Recent research activities have focused on the major three areas based on innovation and technology management, such as product development strategy, innovation strategy, and strategic brand management
KAKEHI Munenori	Production Service System	Engineering study based on management methods to solve problems faced by companies in the fields of manufacturing, services, and human resource development
KINUGAWA Jun	Interactive Systems Design	Research and development of human-robot collaborative systems and related technologies
MIURA Kazuyuki	Algorithms	Computer algorithms such as graph drawing algorithms and their applications
NAKAGAWA Kazushige	Nonlinear Analysis	Analysis on nonlinear problems caused by natural and social phenomena in a mathematical sense
NAKAMURA Shoichi	Data Engineering	Data analytics & Visualization, and their applications including learning analytics and Web visualization
NISHIJIMA Daisuke	Sustainable Economic Systems	Studies of sustainable production and consumption based on engineering system analysis and environmental economics
SHIMADA Kunio	Fluid Systems Engineering	Engineering study based on fluid related to electromagnetism including mechanical engineering, energy, and creation of material by chemistry
SHINODA Nobuo	Applied Information Science	Multimedia techniques such as fixed-point image observation and Web contents design and their applications
TAKAHASHI Takayuki	Mechatronics	Development of human support robots and underwater robots that actually work. Development of related fundamental technologies.

Name	Laboratory name	Research content
TANAKA Akira	Human Medical Engineering	Measurement, analysis and control targeting physiological regulatory system based on a system engineering approach. (e.g. control system for artificial heart, autonomic nervous function analysis)
UTSUMI Satoshi	Network Engineering	Development and performance evaluation of communication protocols in the information networks including the Internet
YAMAGUCHI Katsuhiko	Solid State Physics	The research on magnetism and light (including radiation) based on quantum mechanics from both experimental and simulation perspectives

【Field of Symbiotic Environment Systems】

Name	Laboratory name	Research content
ASADA Takashi	Biomass Resources Engineering	Developments of functional materials by carbonization of renewable biomass resources and their applications to energy technology
GOTO Shinobu	Environmental Planning	Study on planning to improve the environment based on systems approach of integrating arts and science, including environmental education and media
INOMATA Shinji	Inorganic Chemistry	Syntheses and properties of transition metal chalcogen clusters as super iron sulfur proteins
KANEKO Shingo	Conservation Ecology	Our researches are to clarify the ecology and evolution for the conservation of various plants and animals
KAWAGOE Seiki	Watershed Environment System	Our studies target at hydrologic system management to make harmonious coexistence with sustainable watershed environment (disaster, water resources and environment protection)
KAWASAKI Kota	Urban Planning	Urban planning, rural planning, town development, land use, community revitalization, disaster recovery and revitalization, planning theory
KUROSAWA Takahide	Plant Taxonomy	Plant taxonomy and ecology, and studies of biodiversity conservation based on them
NAGAHASHI Yoshitaka	Volcanology and Quaternary Geology	Volcanic explosive eruption history and regional quaternary geology based on geological field survey and petrographical analysis
NAGAHATA Koji	Soundscape	Soundscape studies based on ISO 12913 series, toward designing and planning sustainable soundscapes for well-being
NAKAMURA Kazumasa	Advanced Materials	Preparation and characterization of high-performance carbon materials, composite materials, or engineering ceramics by alloying their precursors with specific nanoparticles
NANBA Kenji	Environmental Microbiology	Researches on microorganisms and environmental cycling for environmental management
OHASHI Hironori	Surface Reaction Chemistry	To reveal scientific phenomena using X- or γ-ray radiation (mainly using XAFS and Mössbauer spectroscopy)
OYAMA Dai	Synthetic Chemistry	Development of highly functionalized transition metal complexes based on non-innocent ligands
SATO Michio	Chemical Engineering	Practical studies of various production/recycle/energy systems based on transport analysis of materials and energy

Name	Laboratory name	Research content
SHIBASAKI Naoaki	Groundwater Basin Management	Considering groundwater as precious water resources, practical research aimed at conservation and effective use of groundwater in each groundwater basin
SUGIMORI Daisuke	Bioengineering	Research on diagnostic enzymes and biomass recycling by microorganisms and enzymes
TAKAGAI Yoshitaka	Analytical Chemistry	Development of new chemical system, analytical method and creation of new material
TAKAHARA Madoka	Psychophysiology	Basic research on human cognition in various conscious states from awakening to sleep and applied research concerning better life and sleep
TSUTSUI Yuji	Experimental Psychology	Experimental studies on the psychological mechanisms of humans and animals, being also researching the psychological effects of the nuclear disaster
TSUTSUMI Tadaaki	Entomology	Study on the morphology, ecology and diversity of insects and small arthropods
YOKOO Yoshiyuki	Watershed Hydrology	Modeling of dominant hydrological processes, estimation and mapping of water resources, prediction of sediment disasters, modeling of forest fires, sediment balance and transport
YOSHIDA Ryuhei	Meteorology	Meteorological/climatological research based on the numerical simulation. Application of numerical forecast/prediction to agriculture, disaster prevention, and renewable energy

5. Special Measures for Education Method

In order to respond to the requests of working people who want to study at the graduate school, the Major adopts the system of opening classes day and night. For specific fields, students can complete the requirements for all the credits (20 credits) by taking two classes offered in the evening (18:00 to 19:30 hrs. and 19:40 to 21:10 hrs.). If you want to avail of this special provision, please consult before applying with the Admissions Office and the instructor from whom you wish to receive instructions after admission.

6. Extended-Study Plan

This is the system allowing students who have restrictions on time, as they are concurrently taking up jobs, etc., to study beyond the standard study period ("Extended-Study Period"). If a student is accepted as an Extended-Study Plan student, the student shall pay the tuition fee in each year at a divided amount, according to the permitted period of extended study (for example, in a Doctoral program, in general, a student completes the program in three years, but under this system, the student can study for four to six years for the same total amount of tuition fee).

Contact: Educational Affairs Division Phone: +81-24-548-8357

II-2. Features of the Major in Environmental Radioactivity (Doctoral Program)

1. Organization and Basic Philosophy of Educational Programs

The Major in Environmental Radioactivity (Doctoral Program) offers class subjects in the three fields of study: ecology, modeling, and measurement. It conducts practical educational activities utilizing the observatory sites in Fukushima and the collaborative relationships with both international and Japanese universities and research institutions. In each Field of study, students will acquire a high level of expertise, which forms the basis of the Doctoral Program and also specialized knowledge and skills required for researchers and professionals in the field of environmental radioactivity. Under the supervision of instructors from different fields of specialization, students will further develop their expertise from multiple perspectives, merging and deepening the specialized knowledge and technologies. Also, students develop the ability to communicate and share the knowledge acquired with the general public by putting 'science communication' into practice.

The aim of the Major in Environmental Radioactivity (Doctoral Program) is to develop researchers and professionals capable of identifying and resolving tasks related to environmental radioactivity, leading academic development of such duties, and contributing to society from a global perspective.

2. Requirements for Completion, Class Attendance, and Conferment of the Degree

For those who study at the Graduate School in principle for three years or longer and satisfy the following requirements for completion, a "Doctoral Degree in Science and Engineering" will be conferred.

(Requirements for Completion and Class Attendance)

Complete more than 20 credits in total, including 6 credits of basic subjects (choose 3 from the 6 basic class subjects), 8 credits of compulsory class subjects of applied subjects, and 6 credits of the compulsory thesis subject, and successfully defend the Doctoral Thesis.

3. Class Subjects and Credits to be Offered

Class Subjects and Credits to be Offered

Graduate School of Symbiotic Systems Science and Technology

Major in Environmental Radioactivity (Doctoral Program)

Subject Type/ Field of Study		Subject Name	Year/ Semester	Credits		Type of Class			Remarks
				Compul-sory	Elective	Lecture	Exercise	Experiment / Fieldwork	
Basic	Ecology	Advanced Practicum in Ecological Radioactivity I	1 (First Semester)		2		*	○	*composed of fieldwork and exercise classes
		Advanced Practicum in Ecological Radioactivity II	1 (Second Semester)		2		*	○	*composed of fieldwork and exercise classes
	Modeling	Advanced Practicum in Analyses of Radioactivity Dynamics I	1 (First Semester)		2		*	○	*composed of fieldwork and exercise classes
		Advanced Practicum in Analyses of Radioactivity Dynamics II	1 (Second Semester)		2		*	○	*composed of fieldwork and exercise classes
	Measurement	Advanced Practicum in Radioactivity Measurement I	1 (First Semester)		2		*	○	*composed of fieldwork and exercise classes
		Advanced Practicum in Radioactivity Measurement II	1 (Second Semester)		2		*	○	*composed of fieldwork and exercise classes
Applied		Special Practicum in Environmental Radioactivity I	2 (First Semester)	2			○		
		Special Practicum in Environmental Radioactivity II	2 (Second Semester)	2			○		
		Special Practicum in Environmental Radioactivity III	3 (First Semester)	2			○		
		Special Practicum in Science Communication	3 (Second Semester)	2		*	○	*	*composed of lecture, exercise, and fieldwork classes
Thesis		Advanced Research on Environmental Radioactivity	1-3	6			○	*	*composed of experiment, fieldwork, and exercise classes

4. List of Instructors Eligible to Serve as Supervisors of Advanced Research on Environmental Radioactivity

Field	Instructor	Description
Field of Environmental Radioactivity	Alexei Konoplev	Based on scientific literature review in the Field of radionuclide behaviour in soil-water environment students select relevant direction of doctoral Thesis and set-up the research plan. According to the plan and selected topic students carry out field sampling and observations as well as laboratory processing of samples and measurements using IER equipment and facilities. Students also study theoretical basis of physico-chemical mechanisms behind fate and transport of radionuclides in the environment. Based on the understanding of underlying processes students set-up simplified empirical and semiempirical models of radionuclide behavior in the environment and test them using obtained experimental Field and laboratory data. Students present their results for domestic and international conferences to discuss their achievements with wide scientific community as well as write and submit articles for relevant international journals. The results obtained in the course of the studies will be summarized in the doctoral Thesis during three years of enrollment.
	Ismail M.M. Rahman	The students will review the latest research publications on reduce, reuse, or recycle technologies for waste management to select the research topic, followed by the formulation of a research plan and direction of the doctoral Thesis. Students will use the plan and directions to learn and design the laboratory works, field-sampling, and instrumental analysis leading to the development of new eco-compliant approaches for environmental remediation or environmental analysis. Students will present their research achievements in domestic and international conferences and discuss with other fellow researchers to improve their research. The results obtained during the three-year course tenure of doctoral studies will be summarized in a doctoral thesis.
	Maksym Gusyev	The research aim of the doctoral course is to involve students in research on the nu-merical modeling of environmental radioi-sotope transport in the terrestrial water cycle. Students will conduct a literature review about recent advances in modeling and design a research plan based on their research interests including water sam-pling, isotope analysis with the IER equip-ment, and numerical modeling such as surface and groundwater flow, floods, droughts, and climate change. Students will learn to make presentations of their research results at domestic and interna-tional conferences and to prepare peer-reviewed manuscripts for publishing in peer-reviewed international scientific jour-nals. These results and published manu-scripts will be compiled in a doctoral thesis within the three-year course.
	Vasyl Yoschenko	Based on the comprehensive review of the research publications related to dynamics of radiocesium in the forest environments in Fukushima and Chernobyl and impact of radiation on the plant species, students choose research topics and formulate research plans of doctoral Thesis. Based on those plans students choose the relevant research methods and experimental sites, and acquire necessary theoretical knowledge and practical skills while obtaining and analyzing the experimental results. Students present their results at domestic and/or international academic conferences and discuss with other researchers for further improvement of their researches. The results obtained in the course of doctoral thesis studies will be summarized in a doctoral thesis during the three years of enrollment.
	Hyoe Takata	The students will obtain scientific findings through the comprehensive understandings of biogeochemical dynamics of radionuclides in the ocean by the latest research papers, followed by the construction of research plans based on the interdisciplinary perspective including chemical oceanoglaphy and analytical chemistry for radionuclides. Then, they will provide results to domestic/international scientific community and publics by publishing to scientific journals/presenting in the conferences. Discussion of their achievements with scientific/public community will also open up profound insight. The research achievements obtained through the course will be summarized as the doctoral Thesis during three years of enrollment.

Field	Instructor	Description
Field of Environmental Radioactivity	Hirofumi Tsukada	Based on the latest research publications related with environmental dynamics and transfer mechanisms of radionuclides, students determine a doctoral thesis throughout extracting research subjects, and formulating research topics and policies. Students make sampling plans and establish analytical methods, and then original researches with analyzing experimental data and factors will be constructed in the Field of environmental radioecology. Research results will be appropriately made presentations at academic conferences in Japan and overseas, and deepened by exchanging opinions and information with other researchers. The studies will be published in academic journals, and will be develop to the general public with science communications. The studies obtained in the researches will be summarized in a doctoral dissertation during the three years of enrollment.
	Tatsuo Torii	Based on the latest research publications relating to radiation measurement and relevant technologies, students extract research topics and formulate research plans and then decide direction of doctoral Thesis. Based on those plans and directions, students practice theoretical construction of radiation detection techniques, system design of the detector, numerical simulation of radiation behavior, experiment, and summary of obtained results in order to learn methods for progressing and improving their researches. Students present their results at domestic and/or international academic conferences and discuss with other researchers for further improvement of their researches. The results obtained during doctoral thesis studies will be summarized in a doctoral thesis during the three years of enrollment.
	Shigekazu Hirao	Students review the latest research publications on atmospheric transport of natural/artificial radionuclides in order to select their research topics and develop research plans towards the development of doctoral thesis. The plans and course of action are carried out and taken by students to learn and design numerical simulations, field sampling, and analysis of radioactivity. Students aim to elucidate the physical principles behind the observed phenomena and acquire new scientific findings. They will present their research achievements in domestic/international conferences and further improve their research through discussions and interactions with other researchers. Students shall develop the doctoral thesis based on the research results that they obtained in the course.
	Yoshifumi Wakiyama	Based on scientific literature review in the field of radionuclide dynamics on terrestrial environment, as well as related academic fields such as hydrology, geomorphology and soil science, students get directions of doctoral thesis and make research plans. Under these plans, students conduct collections of environmental samples (water, sediment etc.) in field, acquisitions of time-series data with monitoring devices, laboratory works for sample processing and measurement, and integrative data analyses. Students present their results at domestic and/or international academic conferences to discuss with other researchers for further improvement of their researches. The results obtained during doctoral thesis studies will be summarized in a doctoral thesis during the three years of enrollment.
	Toshihiro Wada	Based on scientific literature review in the Field of aquatic radioecology, limnology, oceanography, fisheries science, fish ecology, etc., students select relevant direction of doctoral Thesis and set-up the research plan. According to the plan students improve skills related to field sampling, laboratory rearing experiment, analyses of radionuclides data. Students also acquire skills of presentation and problem solving through feedback of their results for domestic and international conferences to discuss their achievements with wide scientific community as well as write and submit articles for relevant international journals. The results obtained in the course of the studies will be summarized in the doctoral Thesis during three years of enrollment.

5. Extended-Study Plan

This is the system allowing students who have restrictions on time, as they are concurrently taking up jobs, etc., to study beyond the standard study period ("Extended-Study Period"). If a student is accepted as an Extended-Study Plan student, the student shall pay the tuition fee in each year at a divided amount, according to the permitted period of extended study (for example, in a Doctoral program, in general, a student completes the program in three years, but under this system, the student can study for four to six years for the same total amount of tuition fee).

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