*This document is a translation from the authoritative Japanese version; this document is for the reference purpose only.

2021 Guide to Entrance Examinations Master's/Doctoral Program Department of Systems Innovation

Graduate School of Engineering, The University of Tokyo

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Website: http://www.sys.t.u-tokyo.ac.jp

2021 Master's Program

This document contains important information regarding entrance examinations at the Department of Systems Innovation, which is supplementary to the Guidelines for Applicants to the 2021 Master's Program, provided by the University of Tokyo's Graduate School of Engineering. This document explains about examination subjects, schedules, and other related materials.

This year, due to the situation regarding the spread of COVID-19, the entrance examination of our department consists only of the document screening and online examinations. Depending on the circumstances, however, the examination style, format, or other details are subject to change. Further information will be notified on the Department of Systems Innovation website (http://www.sys.t.u-tokyo.ac.jp).

1 Entrance Examination

(1) Examination Subjects and Schedules

Date	Examination Subject(s) & Times	Notes
August 22 (Sat)	13:00~ (1) Connection and operation check for the Online Written Exam	For eligible applicants who pass the document screening(2) Refer to footnotes(3), (4) below for the online written examination
August 23 (Sun)	9:00~ (1) Online Written Examination: Problems Designed to Test Ability of Logical Thinking(3), (4)	
August 24 (Mon) ~ August 28 (Fri)	9:00~ Online Oral Examination (ca. 20 minutes per person)	For ALL eligible applicants who pass the document screening(2)

Footnotes:

(1) It is planned to finish around 15:30, however, the schedule (including the start time) is subject to change due to various reasons. Please refer to the department website.

(2) Only applicants who pass the document screening are eligible to take the online written and oral exams.

(3) More details about the written exam (including information about the exam questions) will be announced on the department website from May 30 (Sat).

(4) From comprehensive consideration of the results of the document screening and the English examination, the exceptional applicants, who are exempted from taking the online written exam, may be selected.

(2) Examination Procedures

a) Document Screening

Screening of the applicants for admission will first be conducted by evaluating application documents (more specifically, the applicant's undergraduate performances and the motivation letter with the research proposal, refer to below 2-(2)) submitted by the applicants. Particular importance will be placed on the motivation letter with the research proposal, while the undergraduate grades will be used as a reference. The applicants will be notified of the results of the document screening by August 20 (Thu) via the department website etc.. Following online written and oral examinations will be held only for applicants who successfully pass the document screening. Applicants who fail to pass the document screening will be disqualified from further exam.

b) English Examination

Official TOEFL PBT or TOEFL iBT (including Special Home Edition) scores submitted by applicants

will be used to evaluate the applicants' English skills. For details, refer to "the Notice regarding Foreign-language (English) Examinations in 2021 (Master's Program)", provided by the University of Tokyo's Graduate School of Engineering. The Department of Systems Innovation only accepts official scores from single test date (Test Date Scores), not "MyBest" Scores. For applicant who is unable to submit the TOEFL scores before the submission deadline due to unavoidable circumstances, please refer to below 1-(3)-e.

c) Written Examination
Details including the instruction, schedule and other notifications of the online written exam will be notified via the department website etc. by August 21 (Fri). Upon comprehensive consideration of the results of the document screening and the English examination, exceptional applicants with the highest marks may be exempt from taking the online written exam. The maximun number of the applicants exempt from taking the written exam will be up to 50% of the prescribed total number of successful applicants to be admitted.

d) Oral Examination
Details including the instruction, timetable, and other notifications of the online oral exam will be notified via the department website etc. after the online written exam on August 23 (Sun). All applicants, including those exempt from taking the written exam, are required to take the online oral exam. Admission decisions will be based on comprehensive consideration of the results of all exams including the oral exam (also for the applicants exempt from taking the written exam).

(3) Notes

a) The examination fee will NOT be refunded even for applicants failed to pass the document screening or under any other circumstances.
b) For the online written exam, both a PC (equipped with a webcam and a microphone), stably connected to the internet with sufficient speed, and a smartphone (with a camera), also stably connected to the internet with sufficient speed, are necessary to be prepared. For the online oral exam, a PC (equipped with a webcam and a microphone), stably connected to the internet with sufficient speed, is necessary to be prepared. Further notifications including other necessary items will be notified via the department website etc..
c) All eligible applicants scheduled for the online written exam are required to take the connection and operation check on August 22 (Sat). Details including the instructions and schedule will be notified via the department website etc. by August 21 (Fri).
d) Further notifications about the online written exam will be notified via the department website etc..
e) The TOEFL scores must arrive no later than August 13 (Thu). Any applicant who is unable to submit the TOEFL scores before the submission deadline due to unavoidable circumstances have to inform the Department of Systems Innovation of the situation (with specific explanation for the circumstance) no later than July 31 (Fri) (see the department homepage for the contact information). Depending on the circumstances, the TOEFL scores may be accepted after the deadline, or the applicant's English skill may be evaluated in a special manner.
f) Do not share the URL or the password etc. for the online exams. Do not post any materials of the exams on the internet. Unless explicitly instructed otherwise by the examiner, taking photographs, capturing screenshots and making audio and video recordings is strictly prohibited during the online exams.

2 Required Documents

In addition to "the entrance examination application documents" listed in the section six of "the Guidelines for Applicants to the 2021 Master Program (provided by the Graduate School of Engineering, the University of Tokyo)", applicants must submit two other documents listed below to the Department of Systems Innovation Office by July 22 (Wed). BOTH the electric files (sent/upload on or before the due date) and paper copies (via postal mail, postmarked on or before the due date: as complements to the electric files) are necessary to submit.

(1) Declaration of Preferred Supervisors

Fill out the Declaration of Preferred Supervisors form on page 4 of this document. Please refer to the list of the faculty members and their research outlines on pages 10 - 12.

(2) Motivation Letter with Research Proposal

Applicants must submit a motivation letter with a research proposal. In the letter, applicants should describe (in Japanese or English) their motivation to study at the Department of Systems Innovation together with specific reason to choose the faculty member as the most preferred supervisor in "Declaration of Preferred Supervisors" and a coherent summary of an intended research project at the department. Applicants are required to use the prescribed format for this letter (which can be downloaded from the department website) and submit it as a PDF file. The letter should be prepared electrically and should not exceed two pages in length.

The above two documents should be submitted both electrically (as PDF files) and by postal mail (printed documents) to:

For electric file: Information about the electric file submission (including URL etc.) will be notified via the department website, etc.
(should be sent/upload no later than July 22 (Wed))

For postal mail: Administration Office of the Department of Systems Innovation
Graduate School of Engineering, The University of Tokyo
Eng. Bldg. #3 (room 225), 7-3-1, Hongo, Bunkyo-ku, Tokyo 113-8656, Japan
Tel: +81-3-5841-6533, +81-3-5841-2900 (English-speaking staff)
(postmarked on or before July 22 (Wed))

Caution: The submission deadline and location are different from those for "the entrance examination application documents" and the TOEFL scores.

Note: The PDF files should be named as "supervisors_(applicant_name).pdf" and "motivationl_(applicant_name).pdf", respectively.

3 Other

(1) Enrollment in September 2020

Successful applicants can enroll in the master's program in September 2020. If you would like detailed information about the requirements, please read the Guidelines for Applicants to the 2021 Master's Program, provided by the University of Tokyo's Graduate School of Engineering. If you will meet the requirements for eligibility between September 24 and September 30, 2020 and wish to enroll in September, please contact the following desk before you apply:

Graduate School Team, Administrative Division, School of Engineering, the University of Tokyo
7-3-1, Hongo, Bunkyo-ku, Tokyo 113-8656, Japan
Tel: +81-3-5841-6038, +81-3-5841-7747

(2) Application Schedule B

No winter entrance examinations (Application Schedule B) is currently scheduled by the Department of Systems Innovation, which is also subject to change depending on the circumustances.

(3) If you have any further questions, please contact the Department of Systems Innovation Office (refer to the cover page of this document for contact information).

Declaration of Preferred Supervisors

(Master's Program, Department of Systems Innovation)

Please fill out the form and submit it to the Department of Systems Innovation Office by both electrically (as a PDF file only) (should be sent/upload no later than July 22 (Wed)) and postal mail (a printed document) (postmarked on or before July 22 (Wed)) . Please keep a copy of your submitted form for your records. This format can be downloaded from the department website.

Name	
University (undergraduate)	
Faculty	
Contact Address	Postal code: Address: Tel:
Mobile phone: (For emergency contact)	
Email:	

(1) Referring to the list of faculty members on pages 10 - 12, please fill out the form below with supervisors' numbers (in order of preference).

(2) You can choose up to ten potential supervisors, but do not necessarily need to fill in the form completely. If space is left blank, it will be considered an indication that you do not wish to identify preferred supervisors.

(3) This process aims to match students with their first choice supervisor. However, because each supervisor can accept a limited number of students, it is possible you will not be assigned to your first choice.

(4) If you are assigned to a supervisor not included on your preferred supervisor list, will you accept the placement? Please check one of the boxes below.

☐ Yes, I will accept the placement.
☐ No. I will not accept the placement and will decline admission.

(5) Upon comprehensive consideration of the results of the document screening and the English examination, exceptional applicants with high marks may be exempt from taking the online written exam. If you are considered to be eligible, will you want to be exempt from the written exam? Please check one of the boxes below.

☐ Yes, I want to be exempt from taking the online written exam.
☐ No. I do not want to be the exempt and will take the online written exam.

Order of Preference	1	2	3	4	5	6	7	8	9	10
Supervisor No.										

2021 Doctoral Program

This document contains important information regarding entrance examinations at the Department of Systems Innovation, which is supplementary to the Guidelines for Applicants to the 2021 Doctral Program, provided by the University of Tokyo's Graduate School of Engineering. This document explains about examination subjects, schedules, and other related materials.

This year, due to the situation regarding the spread of COVID-19, the entrance examination of our department consists of the document screening and online examinations. Depending on the circumstances, however, the examination style, format, or other details are subject to change. Further information will be notified on the Department of Systems Innovation website (http://www.sys.t.u-tokyo.ac.jp).

1 Primary Examination

(1) Examination Subjects and Schedules

Date	Examination Subject(s) & Times	Notes
August 22 (Sat)	13:00~ (1) Connection and operation check for the Online Written Exam	For eligible applicants who pass the document screening(2) Refer to below footnotes(3), (4), (5) for the online written examination
August 23 (Sun)	9:00~ (1) Online Written Examination: Problems Designed to Test Ability of Logical Thinking (3), (4), (5)	
August 24 (Mon) ~ August 28 (Fri)	9:00~ Online Oral Examination (ca. 30 minutes per person)	For ALL eligible applicants who pass the document screening(2)

Footnotes:

(1) It is planned to finish around 15:30, however, the schedule (including the start time) is subject to change due to various reasons. Please refer to the department website.

(2) Only applicants who pass the document screening are eligible to take the online written and oral exams.

(3) More details about the written exam (including information about the exam questions) will be announced on the department website from May 30 (Sat).

(4) From comprehensive consideration of the results of the document screening and the English examination, the exceptional applicants, who are exempted from taking the online written exam, may be selected.

(5) Applicants who have completed or are expected to complete a master's program (or professional degree program) at one of the following graduate schools in the University of Tokyo do not need to take the online written exam.

- Graduate School of Engineering
- Graduate School of Frontier Sciences
- Graduate School of Information Science and Technology
- Graduate School of Interdisciplinary Information Studies

(2) Examination Procedures

a) Document Screening

Screening of the applicants for admission will first be conducted by evaluating application documents (more specifically, documents described in 2-(c) or 2-(d) as well as the applicant's academic performances during undergraduate and graduate school) submitted by the applicants. The applicants will be notified of the results of the document screening by August 20 (Thu), via the department

website etc.. Following online written and oral examinations will be held only for applicants who successfully pass the document screening. Applicants fail to pass the document screening will be disqualified from further exam.

b) English Examination
Official TOEFL PBT or TOEFL iBT (including Special Home Edition) scores submitted by applicants will be used to evaluate the applicants' English skills. For details, refer to "the Notice regarding Foreign-language (English) Examinations in 2021 (Doctor's Program)", provided by the University of Tokyo's Graduate School of Engineering. The Department of Systems Innovation only accepts official scores from single test date (Test Date Scores), not "MyBest" Scores. For applicant who is unable to submit the TOEFL scores before the submission deadline due to unavoidable circumstances, please refer to below 1-(3)-e.
Note: Applicants who have completed or are expected to complete a master's program (or professional degree program) at the University of Tokyo will be exempt from the English examination (thus, do not need to submit the TOEFL scores).

c) Written Examination
Details including the instruction, schedule and other notifications of the online written exam will be notified via the department website etc. by August 21 (Fri). Upon comprehensive consideration of the results of the document screening and the English examination, exceptional applicants with the highest marks may be exempt from taking the online written exam. Applicants who want (or do not want) to be subject of this exemption should fill in the corresponding part of the Declaration of Preferred Supervisors (page 9 of this document).
Note: Applicants who have completed or are expected to complete a master's program (or professional degree program) at the Graduate School of Engineering, the Graduate School of Frontier Sciences, the Graduate School of Information Science and the Technology, Graduate School of Interdisciplinary Information Studies in the University of Tokyo do not need to take the online written exam.

d) Oral Examination
Details including the instruction, timetable and other notifications of the online oral exam will be notified via the department website etc. after the online written exam on August 23 (Sun).

(3) Notes

a) The examination fee will NOT be refunded even for applicants failed to pass the document screening or under any other circumstances..
b) For the online written exam, both a PC (equipped with a webcam and a microphone), stably connected to the internet with sufficient speed, and a smartphone (with a camera), also stably connected to the internet with sufficient speed, are necessary to be prepared. For the online oral exam, a PC (equipped with a webcam and a microphone), stably connected to the internet with sufficient speed, is necessary to be prepared. Further notifications including other necessary items will be notified via the departmentt website etc..
c) All eligible applicants scheduled for the online written exam are required to take the connection and operation check on August 22 (Sat). Details including instructions and schedule will be notified via the department website etc. by August 21 (Fri).
d) Further notifications about the online written exam will be notified via the department website etc..
e) The TOEFL scores must arrive no later than August 13 (Thu). Any applicant who is unable to submit the TOEFL scores before the submission deadline due to unavoidable circumstances have to inform the Department of Systems Innovation of the situation (with specific explanation for the circumstance) no later than July 31 (Fri) (see the department homepage for the contact information). Depending on the circumstances, the TOEFL scores may be accepted after the deadline, or the applicant's English skills may be evaluated in a special manner.
f) Do not share the URL or the password etc. for the online exams. Do not post any materials of the exams on the internet. Unless explicitly instructed otherwise by the examiner, taking photographs, capturing screenshots and making audio and video recordings is strictly prohibited during the online

exams.

(4) Oral Examination

a) Please explain your master's thesis research (or research achievement equivalent to a master's thesis), and your plans for your doctoral research. Your knowledge in your field of specialization, preparedness for doctoral work, and ability to conduct research will be evaluated.
b) Applicants are supposed to give an online presentation (above 1-(4)-a) by screen-sharing their electronic presentation materials (such as PowerPoint, Keynote, PDF etc.).
c) Applicants who wish to enroll in September 2020 and who have completed, or are expected to complete a master's (or professional) program by September 30, 2020, do not need to take the secondary oral examination described below. Primary and secondary oral examinations will be combined.

2 Required Documents

In addition to "the entrance examination application documents" listed in the section seven of "the Guidelines for Applicants to the 2021 Doctor Program (provided by the Graduate School of Engineering, the University of Tokyo)", applicants must submit documents listed below to the Department of Systems Innovation Office by the designated due dates. BOTH the electric files (sent/upload on or before the due date) and paper copies (via postal mail, postmarked on or before the due date: as complements to the electric files) are necessary to submit. To prepare these documents, please consult thoroughly with your preferred supervisor.

a) All applicants
Declaration of Preferred Supervisors (page 9 of this document)
(Submission deadline: July 17 (Fri), 2020)

b) Only applicants who pass the document screening
A PDF file of the presentation material you plan to use in the online oral exam. For this item ONLY, submission via postal mail is NOT required. Although applicant can use any presentation software in the actual exam, a PDF-formatted file of the presentation material must be submitted.
(Submission deadline: August 22 (Sat), 2020)

c) Applicants taking only primary examinations (primary oral examination)
① Summary of research to present (4 pages, A4 or US Letter; 1 copy)
② Doctoral dissertation plan (1 page, A4 or US Letter; 1 copy)
(Submission deadline: August 7 (Fri), 2020)

d) Applicants taking secondary examinations (combined primary and secondary oral examinations)
① Summary of research to present and doctoral dissertation plan (6 pages, A4 or US Letter; 1 copy)
② Copy of your master's thesis (or equivalent other document[s] illustrating research achievements) (1 copy)
③ List of research achievements (1 copy)
(Submission deadline: August 7 (Fri), 2020)

The above documents should be submitted both electrically (as PDF files) and by postal mails (printed documents) to:

For electric file: Information about the electric file submission (including URL etc.) will be notified via the department website etc.. (sent on or before the respective due dates)

For postal mail: Administration Office of the Department of Systems Innovation
Graduate School of Engineering, The University of Tokyo

Eng. Bldg. #3 (room 225), 7-3-1, Hongo, Bunkyo-ku, Tokyo 113-8656, Japan
Tel: +81-3-5841-6533, +81-3-5841-2900 (English-speaking staff)
(postmarked on or before the respective due dates)

Caution: the submission deadline and location are different from those for “the entrance examination application documents” and the TOEFL scores.
Note1): The file names of the PDF documents should be simple, descriptive and marked with the applicant name (for example, “research_plan_(applicant_name).pdf”).
Note 2) For submission via postal mail, all documents should be printed single-sided on A4 or US letter papers (no staple).
Note 3) The list of research achievements should be categorized by type, such as: academic journal publication, review, expository paper, presentation, etc..

3 Secondary Examination

The secondary examination is an oral examination and will be administered to those who pass the primary examination (except applicants who meet the conditions described in 1-(4)-c). The examination will be scheduled between late January and mid-February, 2021. Details will be notified to applicants at a later date.

4 Other

a) No winter entrance examinations (Application Schedule B) is currently scheduled by the Department of Systems Innovation, which is also subject to change depending on the circumstances.

b) Successful applicants can enroll in the doctoral program in September 2020. If you would like detailed information about the requirements, please read the Guidelines for Applicants to the 2021 Doctoral Program, Graduate School of Engineering, the University of Tokyo. If you will meet the requirements for eligibility between September 24 and September 30, 2020 and wish to enroll in September, please contact the following desk before you apply:

Graduate School Team, Administrative Division, School of Engineering, the University of Tokyo
7-3-1, Hongo, Bunkyo-ku, Tokyo 113-8656, Japan
Tel: +81-3-5841-6038, +81-3-5841-7747

c) If you have any further questions, please contact the Department of Systems Innovation Office:

Contact form: http://www.sys.t.u-tokyo.ac.jp/contact/
Email: admission@sys.t.u-tokyo.ac.jp
TEL: +81-3-5841-6533, +81-3-5841-2900 (English-speaking staff)
URL: http://www.sys.t.u-tokyo.ac.jp

Declaration of Preferred Supervisors

(Doctoral Program, Application Schedule A, Department of Systems Innovation)

Please fill out the form and submit it to the Department of Systems Innovation Office by both electrically (as a PDF file only) (should be sent/upload no later than July 17 (Fri)) and postal mail (a printed document) (postmarked on or before July 17 (Fri)) . Please keep a copy of your submitted form for your records. This format can be downloaded from the department website.

Name	
University (undergraduate) (postgraduate)	
Contact Address	Postal code: Address: Tel:
Mobile phone:	
Email:	

Upon comprehensive consideration of the results of the document screening and the English examination, exceptional applicants with high marks may be exempt from taking the online written exam. If you are considered to be eligible, do you want to be exempt from the written exam? Please check one of the boxes below.

☐ Yes, I want to be exempt from taking the online written exam.
☐ No. I do not want to be the exempt and will take the online written exam.

Name of preferred supervisor

Faculty Members and Outlines of their Research (1/3)

Supervisor's No.	Name of Supervisor	Research field
1	Kazuhiro AOYAMA Prof. (Research into Artifacts, Center for Engineering)	System Architecture Design, Product Family and Product Platform Design, Product Lifecycle Management (PLM), Model-Based System Design (MBSD), Project Management. Product Service System (PSS), Service Design, Human Centered Manufacturing System, Industry 4.0, Knowledge Management.
2	Kiyoshi IZUMI Prof.	(1) Financial informatics: Artificial market simulation; Financial text mining; AI application in finance. (2) Engineering based economics: Consumer data analysis; Geo-tagged twitter data analysis; Marketing simulation. Those who want to join our laboratory should visit http://kinba.sakura.ne.jp.
3	Yukio OHSAWA Prof.	(1) Methods for discovering opportunities and risks from commercial, natural, and/or behavioral data, (2) Realizing cognition, thought, and decisions for innovating businesses in designed markets of data where strategies for combining/using/reusing data are communicated and created.
4	Yoji OKABE Prof. (Institute of Industrial Science)	Health diagnostics of advanced composite structures for airplanes and automobiles, Structural health monitoring systems, Non-destructive inspection techniques, Fiber-optic ultrasonic sensing systems for remote diagnosis, Internal damage detection using ultrasonic guided waves, Laser ultrasonics, Nonlinear ultrasonics, Acoustic emission.
5	Taira OKITA Assoc. Prof. (Research into Artifacts, Center for Engineering)	Digital twin of artifact systems by synthesizing inspections and computer science, machine-learning molecular dynamics (MD), multi-scale simulations (MD, kinetic Monte Carlo (kMC) etc.), MD-FEM concurrent coupling model, on-the-fly kMC, Non-destructive inspection techniques to detect material degradation at micro-scale.
6	Yasuhiro KATO Prof. (Frontier Research Center for Energy and Resources)	Discovery of deep-sea mineral deposits and space resources for rare-earths and base/rare/precious metals, Decoding of global environmental changes and material cycles during the whole history of the Earth, Design of deep-sea and space resource development.
7	Tomoya KAWABATA Prof.	Optimization of future supply system of liquefied natural gas and research of the reliability of transportation and storage of LNG, Nano-scale microstructural design for economic rationality based on fracture mechanisms using front-line technology, Optimum arrangement of material in building and civil engineering fields against huge earthquakes
8	Taro KANNO Assoc. Prof.	Cognitive Systems Engineering (Human-Centered Systems Design & Management): Team Cognition, Organizational Simulation, Cognitive Data Analysis, Human Factors in Medical, Nursing, ATC, and Emergency Response. Sociotechnical Systems Resilience.
9	Daisuke KITAZAWA Prof. (Institute of Industrial Science)	Marine Ecosystem Engineering. Ocean utilization in harmony with marine ecosystem. Energy, labor, and human saving of marine food production system. A hybrid ship using marine renewable energy. Environmental impact assessment of marine platforms. Water tank testing of flexible structures. Hydrodynamic and ecosystem coupled model.
10	Takashi GODA Assoc. Prof.	Numerical algorithms (e.g., Monte Carlo, quasi-Monte Carlo and multilevel Monte Carlo methods): from theory to engineering applications, Uncertainty quantification, Global sensitivity analysis, Decision making, Value of information analysis, Other related applied mathematics and statistics
11	Seiichi KOSHIZUKA Prof.	Particle method for fluid dynamics (accuracy, speed, multi-phase, snow), useful simulation for human beings (tsunami, flooding, collaboration with companies, mixing tank, composite, cavitation), physics-based computer graphics (visualization, real-time, position-based), credibility of simulation (V&V)
12	Hajime KOBAYASHI Assoc. Prof.	Biotechnologies for energy conversion, production and resource utilization. Technological applications of microbial symbioses to energy-related industries. Electromethanogenic conversion of CO_2. Energy-related environmental technologies (e.g. water treatment).
13	Kozo SATO Prof. (Frontier Research Center for Energy and Resources)	Sustainable Carbon Cycle (CCS, Geological Storage of CO_2 and Bio-conversion, Monitoring, Assessment of Environmental Impacts), Energy Resources Development and Uncertainty (Value of Information, Decision Making, EOR/IOR), Simulation for Unconventional Resources (Shale Gas, FDM・BEM・CIP・LBM・MD).
14	Ryuichi SHIBASAKI Assoc. Prof. (Resilience Engineering Research Center)	Global logistics network modelling and policy simulation: international, intermodal container cargo simulation, logistics analysis/modelling using the large-scale vessel movement database, and sequential modelling of international trade and logistics. Model applications to many kinds of logistics projects mainly planned for developing countries of the world
15	Kazuya SHIBATA Assoc. Prof.	Investigation of Phenomena and Optimization of Design by Numerical Simulation, Development of New Systems Using Physics-Based Simulation, Numerical Analysis of Fluid Force Acting on Ships and Offshore Structures, Tsunami Simulation in Coastal Areas, Engineering of Disaster Prevention and Mitigation, Development of Evaluation Method for Safety, Particle Methods.
16	Kazuki SHIBANUMA Assoc. Prof.	Structural integrity to achieve sustainable society: Investigation on fracture mechanics of materials and structures, Development of prediction method of aging degradations and maintenance theory, Innovative physical modeling to integrate multiscale
17	Takashi SHIMADA Assoc. Prof.	Statistical Physics and nonlinear science on biological, ecological, social and economic systems. Namely, ①Theoretical study of universal aspects, such as robustness, of open and evolving systems ②Simulation study of collective phenomena in biological, social, economic systems ③Data analysis of the dynamics of real complex systems.

Faculty Members and Outlines of their Research (2/3)

Supervisor's No.	Name of Supervisor	Research field
18	Katsuyuki SUZUKI Prof.	Structural mechanics, computational mechanics and optimal design of multi-disciplinary system, especially ship structure and ocean structures. Sports engineering and human dynamics and optimization of sporting goods and motion (Supervise with Prof. Yonekura).
19	Hideyuki SUZUKI Prof.	Research on Ocean Renewable Energy development system for establishment of sustainable society, especially Floating Offshore Wind Turbine system. Research on floating systems for Ocean Resources, Energy and Space development, and related concept development, numerical model and validation, development of simulation method and risk analysis.
20	Jun TAKAHASHI Prof.	Thermoplastic CFRP for mass production automobile, LCA, Recycling, FEM simulation (structural optimization, crash safety, pedestrian safety).
21	Kenji TANAKA Assoc. Prof. (Department of Technology Management for Innovation)	(1) Systems Design for Transportation, Distribution, Energy, and Other Network Services, (2) Data analysis, Simulation, Forecasting, Risk evaluation for Systems Design.
22	Gjergj DODBIBA Assoc. Prof.	Resources processing and recovery; Physical and/or chemical processing of materials; Wastewater treatment; Soil remediation; Solid waste management; Environmental impact assessment;
23	Fujio TORIUMI Assoc. Prof.	Computational Social Science (Social Data Analysis, Agent-based Simulation) and AI for Society. Topics: Social Media, Web Services, Transportation Data, Medical Information, Complex Networks, Machine Learning, and Game Theory.
24	Kentaro NAKAMURA Assoc. Prof.	(1) Efficient methods for exploring deep-sea mineral resources, (2) Analytical methods for simple and precise determination of rare metals, (3) Formation processes and geological background of metal resources, (4) Evolution of Earth's surface environment and life.
25	Yoshiaki NISHIBAYASHI Prof.	Toward global innovations in renewable energy sources on the basis of catalysis technology, development of novel transformations (1) for use of ammonia as a new energy source and (2) for creation of energy and resources. Experimental chemistry to create new molecules by your hands.
26	Kimihiro HASHIBA Assoc. Prof.	Innovation in resource engineering: sophisticated mining system (rapid excavation, deep sea mining), risk reduction in resource development, long-term usage of underground structures (future forecast, long-term behavior), and geomechanical modeling/simulation.
27	Katsunori FUKUI Prof.	Systems Innovation Engineering of Resources Exploration and Development for Safe and Secure Society (Deep Sea Mining, Preservation of the Environment), Geospace Engineering, Rock Mechanics and Engineering (mechanical modeling/simulation), Mining Machinery.
28	Hideki FUJII Lecturer	Research and Development of Large-scale Multi-agent-based Traffic Simulation Utilizing High-performance Computing. Virtual Social Experiment. Simulation-based Understanding and Decision Support about Social Systems.
29	Kazuo FURUTA Prof. (Resilience Engineering Research Center)	Cognitive Systems Engineering, simulation of socio-technical systems based on human modeling. Resilience Engineering, institutional design and society design for realizing resilient society, technology development for assessing and enhancing resilience of critical infrastructure.
30	Yoshihiro MASUDA Prof.	Technology Innovation in Energy Resources Development: Methane Hydrates (New Gas Recovery Process with CO_2 Injection, Simulator Development), Application of Digital Oil Technology (Molecular Dynamics Simulation) to Gas Resource Assessment, and Enhanced Oil Recovery, etc.)
31	Hideaki MIYAMOTO Prof.	(1) Space resources based on planetary geology; (2) Planetary exploration (incld. Hayabusa-2 asteroid mission and MMX Mars satellite sample-return mission) and planetary data analysis; (3) Instrument development; (4) EPO activities at TeNQ space museum as a part of consensus building.
32	Shinsuke MURAKAMI Assoc. Prof. (Department of Technology Management for Innovation)	Mineral Economics & Industrial Ecology (MFA/MSA): Sustainable Resource Use, Evaluation of Social Systems including legislative schemes for recycling of e-wastes and others containing precious/specialty metals, Environmental Impact Assessment of mining, Minerals Market Analysis (simulation / econometrics approaches)
33	Kazutaka YASUKAWA Lecturer (Frontier Research Center for Energy and Resources)	(1) Characterization of seafloor mineral resources based on high-precision chemical analyses, (2) Elucidating genesis of seafloor mineral resources by multivariate statistical techniques, (3) Clarification of Earth system's responses to climate changes based on statistical and modeling approaches. Targeting resources and environmental issues by understanding the Earth system.
34	Tomonori YAMADA Assoc. Prof.	Large-scale Computational Mechanics Simulation for Safe Society, Multiphysics Simulation, High-performance Computing on Cutting Edge Supercomputers (K computer etc.) .

Faculty Members and Outlines of their Research (3/3)

Supervisor's No.	Name of Supervisor	Research field
35	Shinobu YOSHIMURA Prof.	(1) High-performance Multiphysics Computational Mechanics Simulation and Its Application to Innovative Artifacts Design, (2) Resilient Design of Urban Traffic System Using Intelligent Multi-agent Simulator and Finance Theory, (3) R&D of Innovative Clean Energy Systems such as Off-shore Wind Farm and Coal Gasification Power Plant
36	Kazuo YONEKURA Lecturer	Data-driven design for industrial system using machine learning. Industrial application of machine learning considering explanation to users and society. Design optimization of structure, fluid etc. based on mathematical programming.（Supervise with Prof. K. Suzuki)