October 2020 Admission

Graduate School of Advanced Science and Engineering

(Master's Course)

Application Guidebook

(Special Master Course for Students to Study Japanese-style Manufacturing)

Applied Chemistry Program
Chemical Engineering Program
Electrical, Systems, and Control Engineering Program
Mechanical Engineering Program
Transportation and Environmental Systems Program
Architecture Program
Civil and Environmental Engineering Program
Informatics and Data Science Program

October 2019

広島大学

Hiroshima University

Admission Policy of Graduate School of Advanced Science and Engineering

【Master's Course】

The Division of Advanced Science and Engineering of the Graduate School of Advanced Science and Engineering seeks students who have the following aspirations and motivation and have the basic academic abilities necessary for it:

① An ambition for the promotion of advanced and high-level academic and inter-disciplinary research;

② The will to be engaged in professional occupations such as researchers and engineers in areas related to natural science, engineering, and information science;

③ A zeal for establishing the "science for sustainable development" from a multifaceted perspective and for solving regional and international issues by acquiring knowledge and study skills for the academic areas related to natural science, engineering, and information science as well as a wide range of intelligence; and

④ Common sense and ethics required for a member of society.

Application Guidebook

October 2020 Admission

This special master course is designed for students to study Japanese-style manufacturing. This course includes the following courses and classes etc.

Intensive Japanese Language Course, Japanese-Style Manufacturing Course (Problem Based Learning), Internship in Companies in Hiroshima Prefecture, Regular Engineering/Technology Classes, Master Course Research, Dissertation.

The Graduate School of Advanced Science and Engineering seeks students in the following capacity:

1. Number of students to be admitted

The number of students to be admitted and the address for submission of application documents are listed below.

October 2020 Admission

Program	Number of Students	Address for Submission
Applied Chemistry	Several	Preparatory Office for the Establishment of Graduate School of Advanced Science and Engineering, Hiroshima University (Graduate Student Section, Student Support Office of Graduate School of Engineering) 1-4-1 Kagamiyama, Higashi-Hiroshima 739-8527, Japan Tel: +81-(0)82-424-7518
Chemical Engineering		
Electrical, Systems, and Control Engineering		
Mechanical Engineering		
Transportation and Environmental Systems		
Architecture		
Civil and Environmental Engineering		
Informatics and Data Science		

* The application guidebook for this special course are limited to the above 8 programs. Please note that programs other than the above are not included in the Graduate School of Science and Engineering.

2. Eligibility for Application

Applicants must be foreign nationals and belong to the following applies:

(1) Graduates/students from a partner university or Hiroshima University.

(2) Those who visit Japan for study with a will to work for companies in Hiroshima.

(3) Those who can speak Japanese or willing to study Japanese.

3. Application Requirements

Applicants must fall under all of the above categories and have scored over 505 on the TOEFL®-PBT or

over 63 on the TOEFL®-iBT (over 600 on the TOEIC® or over 5.5 on the IELTS®) or equivalent. Scores must be submitted at the time of application. Those who have received higher education in English can apply.

4. Application Procedure

(1) Application Period

The application period shall run from **December 1, 2019** to **January 31, 2020**.

(2) Application Documents

No.	Application Documents	Notes
1	Admission Application Form	Use the prescribed form.
2	Reasons for Application	Use the prescribed form.
3	Summary of Bachelor's Thesis	Use the prescribed form.
4	Research Plan	Use the prescribed form. (Should be made after consulting with a prospective academic advisor of HU.)
5	Letter of Recommendation	Recommendation from an academic advisor. (Should be made by typewriting and signed by handwriting.)
6	Pledge	Use the prescribed form.
7	Application Fee	30,000 Japanese yen Fill out your name and address on the prescribed payment form and pay the application fee at a bank in Japan (you can pay at neither Japan Post Network nor Japan Post Banks). A bank transfer fee will be charged, and receipts of payment with a bank stamp dated on and before **January 31, 2020** only shall be recognized as valid as an application document, so please check your bank's hours of reception before submission.
8	Academic Transcript	Must be written in English or Japanese issued by a university or college president or dean.
9	Certificate of Graduation, or Certificate of Expected Graduation	Must be written in English or Japanese issued by a university or college president or dean.
10	TOEFL®/TOEIC® /IELTS® scores (at the time of application, scores shall be reviewed and then returned)	Submit the actual score results (not a copy) from exams taken from **February 2018** until the time of application. Applicants will be unable to apply if they don't submit their original sheet. (The document is not required for applicants who have received higher education in English. (Instead, please submit the document that can prove that.)) Note: Please submit scores from one of the following tests: * TOEFL® * TOEIC® * IELTS®
11	Certification of Japanese Ability	Certification of Japanese ability, if any (additional)

Note i) All documents above and examination fee will not be returned for any reason.

ii) Regardless of what is written in 4. Application Procedures (1) Application Period, the transfer period for the application fees shall be **December 1, 2019** to **January 31, 2020**.

(3) Application Method

Please submit all documents of (2) to the following office within the period of (1) by mail.

Preparatory Office for the Establishment of Graduate School of Advanced Science and Engineering, Hiroshima University
(Graduate Student Section, Student Support Office of Graduate School of Engineering)
1-4-1 Kagamiyama, Higashi-Hiroshima 739-8527, Japan Tel: +81-(0)82-424-7518

5. Method of Selection

Students will be selected on the basis of the submitted documents and the results of the oral examination using Skype.

* Details of the examination date and venue are informed you by your prospective academic advisor (or program manager).

6. Announcement of Results

The notification of admission will also be sent to accepted applicants by e-mail **March 10, 2020**.

(No telephone enquiries regarding admission shall be accepted)

7. Admission Procedures

(1) Admission Documents

Documents shall be sent to successful applicants.

(2) Admission and Tuition Fees

a) Admission Fee: 282,000 yen
b) Tuition Fee: 535,800 yen (per year)
*Admission fees shall not be returned for any reason.
*The above fees are listed as current for **December 2019**. Should the amount be revised at the time of or after enrollment, students will be required to pay the revised fee.

(3) Admission Procedure Period

New students will begin procedures in the middle of **September 2020**.
(Details will be announced separately.)

8. Scholarship

Allowance: Each grantee will be provided monthly with **100,000** yen.
The scholarship will not be paid to a grantee who takes a leave of absence or is long absent from Hiroshima university.
Scholarship will be cancelled for a grantee in the following cases. Furthermore, if scholarship payments were made during the period the following cases applied, the grantee may be ordered to return scholarship payments received during that period.

① If any of his/her application documents is found to be falsely stated;
② If he/she is subjected to disciplinary action, such as expulsion or removal from register, taken by Hiroshima University;
③ If it becomes definitive that the grantee will not be able to complete his/her course within the standard course term because of his/her poor academic achievement or suspension.

9. Inquiries, Submission

Preparatory Office for the Establishment of Graduate School of Advanced Science and Engineering, Hiroshima University
(Graduate Student Section, Student Support Office of Graduate School of Engineering)
1-4-1 Kagamiyama, Higashi-Hiroshima 739-8527, Japan
Tel: +81-(0)82-424-7518 Fax: +81-82-424-5461
E-mail: kou-gaku-daigakuin@office.hiroshima-u.ac.jp

10. Others

(1) Regarding Personal Information Management and Handling

Any personal information acquired through this application (full name, date of birth, sex, etc) shall be used only for the purposes of admission selection and notification. Hiroshima University shall keep the data only of those who have been admitted for the purposes of student support (scholarship application, tuition waiver application, etc) and for the purposes of examination and research (entrance exam improvement, applicant trend surveys/analysis, etc). Hiroshima University will not use personal information for any other purpose, nor provide information to any third party.

(2) Smoking will be prohibited entirely in all HU campuses from January, 2020.

※The Kasumi Campus has been smoke-free since April, 2018.

11. Faculty Members of Engineering Program and Informatics and Data Science Program in Graduate School of Advanced Science and Engineering

Applicants should always consult with supervisor for research content prior to application.

In addition, following supervisors may be changed by transfer. In that case, it will be posted on the website of Graduate School of Advanced Science and Engineering, so please check in advance before consultation.

Applied Chemistry Program

Laboratories	Staff		Education / Research Fields
Applied Organic Chemistry	Professor Assistant Professor	Atsushi Ikeda Kouta Sugikawa	Education and research on development of synthetic reactions and supamolecular complexes applied for creating useful organic molecules in everyday life and high technology.
Organic Materials Chemistry	Professor Assistant Professor	Joji Ohshita Yohei Adachi	Education and research on organosilicon compounds, in particular synthesis of polysilane derivatives containing π-conjugated systems and their applications to organic electronic materials, and development of functional dye materials with epoch-making optoelectronic characteristics .
Functional Polymer Chemistry	Professor Associate Professor Assistant Professor	Takeshi Shiono Yuushou Nakayama Ryo Tanaka	Education and research on polymer chemistry, especially, precision polymerization catalyzed by transition metal complex and development of new polymers from renewable biomass.
Reaction Design Chemistry	Professor Associate Professor Assistant Professor Assistant Professor	Itaru Osaka Hiroto Yoshida Kimihiro Komeyama Saito Masahiko	Education and research on novel organic functional and semiconducting materials such as π-conjugated polymers, and their application to energy and/or electronic devices such as organic solar cells. Education and research on novel organic synthetic methodology by developing new reactions, reagents, and catalyst, and their application to syntheses of various organic functional materials and pharmaceuticals.
Analytical Chemistry	Professor Associate Professor	Shinjiro Hayakawa Kenji Komaguchi	Education and research on analytical chemistry, especially, development and application of new methods in x-ray spectroscopy.
Materials Physical Chemistry	Professor Associate Professor Assistant Professor	Yousuke Ooyama Ichiro Imae Keiichi Imato	Development of novel functional dye and polymer materials with epoch-making optoelectronic characteristics, fluorescence sensing ability and therapeutic activity. Education and research on new functions of organic/inorganic materials and their applications to novel electronic/optoelectronic devices
Inorganic Materials Chemistry	Professor Professor Assistant Professor	Kei Inumaru Kiyofumi Katagiri Hiroshi Fukuoka	Research and education on ceramics, with main interests on molecular design, synthesis, characterization, and applications of new inorganic or inorganic-organic hybrid materials having functional nano-structures.
Environmental Catalyst Chemistry	Professor Assistant Professor	Masahiro Sadakane Nao Tsunoji	Synthesis of inorganic microporous and mesoporous materials such as zeolites and related materials, and their application to catalysts and adsorbents in environmental and energy research fields.

Chemical Engineering Program

Laboratories	Staff		Education / Research Fields
Thermal-Fluid Engineering	Professor Associate Professor	Akihiro Yabuki Takashi Ogi	Researches on the production of functional fine- and nano-particles and thin films using aerosol and liquid process and the evaluation of related phenomena such as fluid, heat transfer, chemical reaction of the gas-liquid, mass transfer inside the reactor, nucleation/growth, clean technology, self-healing coatings, recovery of rare earth, and alternative materials of rare earth.
High-Pressure Fluid Property	Professor Associate Professor Assistant Professor	Shigeki Takishima Shinichi Kihara Ikuo Ushiki	Measurement and modeling of the equilibrium and transport properties for supercritical fluid + polymer systems. Development of innovative material processing technology and functional organic and inorganic materials utilizing particular characteristics of supercritical fluids.
Polymer Technology	Professor Assistant Professor	Satoshi Nakai Takehiko Goto	Education and research on restoration of aquatic and soil environment, wastewater treatment, and utilization of waste to produce valuable materials. Development of separation system using stimulus responsive polymers or polymer gels. Research on the structure controlling method of polymer gel. Development of a highly efficient functional polymer and analysis of reaction using polymer.
Separation Technology	Professor Associate Professor Assistant Professor Assistant Professor	Toshinori Tsuru Masakoto Kanezashi Hiroki Nagasawa Liang Yu	Development and characterization of nano- or subnano-porous ceramic membranes, and their application to gas separation, pervaporation / vapor permeation, nanofiltration / reverse osmotic processes, and catalytic membrane reactors. Transport mechanism of gas/liquid molecules through microporous membranes. Evaluation of membrane-based separation processes.
Fine Particle Technology	Professor Associate Professor Assistant Professor	Kunihiro Fukui Toru Ishigami Tomonori Fukasawa	Education and research on the development of novel high-performance classification system, the development of powder treatment process using microwave heating method, the improvement and life prediction of bag filter system, the analysis of particle dispersed system by CFD-DEM simulation, the fabrication of standard particles for ISO, the measurement of physical and chemical particle property, the application of zeta potential measuring device and vibration fluidized bed.
Equipment Materials Engineering	Professor Assistant Professor	Manabu Shimada Masaru Kubo	Education and research on the following topics: synthesis and fabrication of fine materials and micro-controlled surfaces by the generation and transport of gasborne matter; contamination phenomena induced by small particulate matter and trace amount of gaseous matter; development of synthetic process of organic-inorganic hybrid porous materials; investigation of mechanism of particle formation and assembly in small droplets; synthesis, property and application of inorganic nanoparticles and nanostructures.
Green Process Engineering	Professor Associate Professor Assistant Professor Assistant Professor	Wataru Nishijima Soonchul Kang Zhou Shujun Akira Umehara	Education and research on treatment of waste and wastewater, evaluation of environmental impacts of the human activities and its reduction by greenization of chemical processes, and ecological engineering for conservation and restoration of damaged ecosystems.

Electrical, Systems, and Control Engineering Program

Laboratories	Staff		Education / Research Fields
Social Informatics	Professor Associate Professor Assistant Professor	Ichiro Nishizaki Tomohiro Hayashida Shinya Sekizaki	Research interest of Social Informatics Lab covers decision analysis for organizations with competitive or cooperative relationships, data analysis of business activities, modeling of artificial agents with psychobehavioral preferences and so forth. Our researches also relate to the following disciplines: game theory, optimization, decision analysis, simulation analysis, artificial agent modeling, network analysis, machine learning, evolutionary computation, nonlinear data analysis, and applications to electricity power systems.
Production Systems Engineering	Professor Associate Professor Assistant Professor	Katsuhiko Takahashi Katsumi Morikawa Keisuke Nagasawa	Research on design, planning and control techniques of large-scale, complicated manufacturing systems and supply chains. Some research topics are the utilization of human capability as a fundamental element of the production system, the development of manufacturing systems which adapt to the change of manufacturing environment, the application of optimization and simulation techniques for planning facility, production-distribution-inventory systems, and service systems, and the development of scheduling techniques.
Mathematics	Professor Professor Professor Associate Professor Associate Professor Associate Professor Associate Professor Assistant Professor	Masaru Ikehata Tetsutaro Shibata Masao Hirokawa Wakako Kawashita Megumi Sano Yong Moo Chung Yuta Wakasugi Satoki Uchiyama	Research on inverse problems and the eigenvalue problems of differential equations. Mathematical analysis of linear PDEs. Stochastic differential equations, stochastic analysis and their applications. Dynamical systems and ergodic theory. Research on nonlinear elliptic and parabolic differential equations, and applications to the dynamical system and phenomenological theory. Statistical physics of neural networks.
Control Systems Engineering	Professor Associate Professor Lecturer Assistant Professor	Toru Yamamoto Shuichi Ohno Shin Wakitani Masayoshi Nakamoto	Research and education on system control technology and digital signal processing. Specifically, adaptive & learning control system technology for industrial systems and welfare systems, and digital signal processing for communication systems and image processing.
Electric Power and Energy System	Professor Associate Professor Assistant Professor Assistant Professor	Naoto Yorino Yoshifumi Zoka Yutaka Sasaki Satoshi Taoka	Research mainly concerned with large-scale, complex and nonlinear electric power systems, including problems of operation and planning, voltage stability, frequency control, reliability, renewable energy, distributed power generation, microgrid/smartgrid, vehicle-to-grid, optimization technique, control system design, artificial intelligence application, analysis technology, algorithm development, etc.
Biological Systems Engineering	Professor Professor Assistant Professor	Toshio Tsuji Yuichi Kurita Zu Soh	The main subject of research is the measurement, analysis and modeling of biological functions with its engineering applications. The research area covers human motion analysis, bioelectric signal processing, welfare robotics, artificial life, soft computing, electric circuit design and medical electronics engineering, etc.
Robotics	Professor Associate Professor Assistant Professor	Idaku Ishii Takeshi Takaki Mingjun Jiang	Research on hyper-human robotics technology exceeding man's capability, and its real world applications. For example, high-speed robot vision, robot mechanism design, mobile robot, sensor-based manipulation, multimedia applications, industrial applications, medical applications, bio-applications, etc.
Applications of Cybernetics	Professor Professor Associate Professor	Yoshio.Matsumoto Hidehiko Komine Natsuki Miyata	Research on the modeling and application of a complicated phenomenon. For example,measurement and diagnosis for the living body information and system integration, engineering application, etc.

Mechanical Engineering Program

Laboratories	Staff		Education / Research Fields
Mechanics of Materials	Associate Professor	Takeshi Iwamoto	Experimental study on impact transformation-thermo-mechanical behavior of materials with phase transformation and characterization by observation of microstructure/ Design and development of new member with high collision energy absorption for automobiles by using adhesive joint and new material with high impact energy absorption based on stress analysis of crash process Development and modification of impact testing method Multi-scale analysis of TRIP steel based on the homogenization technique. Dislocation dynamics simulation by level-set method and coupling with a transformation-crystal plasticity theory. Simulation of interface motion driven by phase transformation using the level-set method Mesh free method such as SPH and X-FEM for stress analysis
Fluid Engineering	Professor Associate Professor Assistant Professor	Keiya Nishida Youichi Ogata Hong-Liang Luo	Research on engine in-cylinder flow phenomena Liquid fuel atomization, spray evaporation and mixture formation mechanisms Fuel injection technology for combustion and emission control Elucidation of the flow mechanism in engineering applications. Fluid force analysis of such as fish using fluid-structure interaction simulations. Measurment and numerical study on two-phase flow. Study on Wall Impinging Fuel Spray and Its Combustion/Paticulate Formation Mechanisms in Gasoline Engine Combustion Chamber
Reactive Gas Dynamics	Professor Associate Professor Assistant Professor	Takuma Endo Tomoyuki Johzaki Wookyung Kim	Fundamental studies of high-speed reactive gas flows such as detonations or explosions. Applied and fundamental investigations on aerospace propulsion devices using detonations or laser-produced plasmas. Development of new internal combustion engines or heat sources using high-speed combustion. Numerical study on laser-plasma physics such as laser fusion or laser detonation. Physics and chemistry of gas explosions
Machinery Dynamics	Professor	Ryo Kikuuwe	Studies for analyzing, simulating, and controlling mechanical systems such as robotic systems. Specifically: * Stable realtime simulation of deformable objects; * Force control techniques for human-robot collaboration; * Modeling and computational techniques for pneumatic tires; * Master-slave control of biped robots; * Physics-based modeling of hydraulic systems; * Control techniques for cancelling joint friction;
Mechanical Design and Systems	Professor Assistant Professor	Soichi Ibaraki Kiyotaka Ikejo	Three-dimensional measurement of the motion of machine tools and its control; Kinematic modelling of machine tools and robots and error diagnosis; Three-dimensional geometric measurement; Monitoring and intelligent control of machining processes. Strength, failure analysis and design of gear drives; Simulation of gear vibration and noise; Development and design of a new-type gear with higher strength and performance than that of the Involute gear; Estimation and improvement of power transmission performance of gear and traction drives; Improvement in performance of gear pumps; Design and tribology of various machine elements.
Machining and Machining System	Professor Associate Professor Assistant Professor	Keiji Yamada Ryutaro Tanaka Katsuhiko Sekiya	The sensing technology and the components for machine tools. Machining for the difficult-to-cut materials. Development of the free-cutting steels and the new cutting tools. Laser assited machining process Laser processing of brittle materials.
Manufacturing Systems A	Professor	Kazuhiro Ohkura	The realization of autonomous artifacts and the collective intelligence based on the concept of autonomous distributed systems by building swarm robotic systems or conducting computer simulations with emerging techniques in the field of computational intelligence.
Manufacturing Systems B	Associate Professor	Toru Eguchi	Research on design, planning and control of manufacturing systems. Research on optimization of production planning and scheduling.
Control Engineering	Professor Associate Professor	Nobutaka Wada Yu Kawano	Research on control theory and its application ・Optimal control for constrained control systems ・Robust control ・Control application to mechanical systems ・Structure analysis of biological networks ・Controller design to achieve the prescribed privacy level

Laboratories	Staff		Education / Research Fields
Materials Physics	Professor Associate Professor	Gen Sasaki Kenjiro Sugio	Elucidation of physics phenomena in high-functional and high-performance metals, ceramics and metal matrix composites, and development of these materials; (1) Material process optimization with nano- and meso-scale texture control, (2) Evaluation of mechanical and functional properties in wide range from nanoscale to mililliscale, (3) Observation and characterization of microstructure with optical, scanning electron and transmission electron microscopes, (4) Modeling with computer simulations (molecular dynamics method, finite element method, etc.)
Property Control of Materials	Professor Assistant Professor	Kazuhiro Matsugi Yongbum Choi	Analyses and micro-macro modeling for materials fabrication process, and development of materials property control by their techniques; (1) casting using the material control technology, the alloying using the sintering method, and a diplo-phasing and compositing, (2) thermal and mechanical conditions of the material engineering quality of the material by the analysis of a material process, research-and-development, (3) nano-meso scale by the mechanical engineering techniques, such as control of the dynamic or control
Materials Joining Science and Engineering	Professor	Motomichi Yamamoto	・Development of high quality / high efficiency welding and blazing processes using hot-wire laser welding, hot-wire GTAW and hot-wire blazing techniques ・Evaluation of hot cracking susceptibility and elucidation of mechanizm of hot cracking during welding using in-situ observation technique ・Prediction method for hot cracking during welding using computational simulation (FEM) ・In-situ temperature measurement using high-speed cameras during welding ・Prediction method for microstructure formation of weld metal during welding using thermodynamics database
Engineering Elasto-Plasticity	Associate Professor Assistant Professor	Ryutaro Hino Hiroshi Hamasaki	Theory of elasto-plasticity and its applications Mechanical properties of materials, and identification of material parameters Numerical simulation and process analysis of cold/hot (warm) metal forming Optimization problems in metal forming Crystal plasticity and micro mechanics
Strength and Fracture of Materials	Professor Associate Professor	Atsushi Sugeta Hiroyuki Akebono	The microscopy of the fatigue crack growth mechanism by using high-resolution microscope The evaluation of strength of advanced structural materials The estimation of fatigue strength of spot and laser welded structures.
Thermal Engineering	Professor Associate Professor Assistant Professor	Yukihiko Matsumura Shuhei Inoue Machi Kanna	Chemical humidity control for air conditioning, production of hydrogen from biomass using supercritical water, heat transfer and chemical reactions in supercritical water, structural analysis of nanocrystal, fundamental research of carbon nanotube, hydrothermal pretreatment of lignocellulosic biomass
Combustion Engineering	Professor Associate Professor	Akira Miyoshi Daisuke Shimokuri	• Construction of reaction mechanisms for practical combustion • Improvement of IC engine combsution based on detailed kinetc analysis • Measurements of ingition properties of fuel components and mixtures • Improvement of combustion based on the ignition characteristics of fuels • Low NOx, Low SPM tubular combustion • Micro combustor • Fire safety
Plasma Science	Professor	Shinichi Namba	Applications of high-density arc plasmas to scientific and engineering fields Development of plasma window for separation between vacuum and atmosphere Development of coherent/incoherent bright X-ray sources driven by lasers
Quantum Energy Applications	Professor Associate Professor Assistant Professor	Satoru Endo Kenichi Tanaka Tsuyoshi Kajimoto	Monte Carlo simulation on interactions of radiations with matter. Microdosimetry of radiations. Study of Bron neutron capture therapy and brachytherapy, Measurement of nuclear reaction cross sections in high and medium energy radiations Measurement of gamma radiations, alpha and beta particles and environmental radioactivities.
Quantum Materials Science and Engineering	Professor Assistant Professor	Takayuki Ichikawa Rini Singh	・Quantum Effect of Hydrogen in Materials ・Corelation between Electronic States and Functions of Materials which are in particular related to Secondary Battery Materials (Li-Ion and Ni-MH), Fuel Cell with novel mechanisms, Energy Conversion Systems (Themochemical Hydrogen Production and Electrolysis of NH_3 and H_2O) and/or Solid State Hydrogen Storage Materials.

Transportation and Environmental Systems Program

Laboratories	Staff		Education / Research Fields
Structural Systems	Associate Professor Associate Professor	Yoshikazu Tanaka Satoyuki Tanaka	Buckling and ultimate strength evaluations Fracture and fatigue strength evaluations Computational Mechanics, Applied Mechanics, Solid/Structural Analysis Research on a floating structure for offshore wind power generation Energy harvesting using mechanical vibration Nondestructive inspection, Numerical electromagnetic field analysis
Structural Innovation	Professor Associate Professor	Mitsuru Kitamura Akihiro Takezawa	Design technologies and optimization methods for large-scale structures such as vehicles. Topology optimization method and its application. Computational method for structural analysis.
System Safety	Associate Professor	Eiji Shintaku	Research on safety assessment and maintenance for structures and transportation equipment systems. Development of sensors for dynamic load and deformation measurement. Development of instrumentation system for structural safety management. Automatic control and planning of ship equipments and systems.
Transportation System Innovation	Professor Assistant Professor	Kunihiro Hamada Noritaka Hirata	Research on planning and design methodology for transportation sytems using ICT Design and planning of new transportation system using maritime logistics big data Development of efficient construction system using factory monitoring
Marine Transportation System	Professor Assistant Professor	Hironori Yasukawa Masaaki Sano	Development of an environment friendly marine vehicle Research on prediction of performances of marine vehicle Research on marine navigation safety Research on a new energy transportation
Fluid Dynamics for Transportation and Environmental Systems	Associate Professor Assistant Professor	Hidemi Mutsuda Takuji Nakashima	Research on the reduction of wind resistance acting on a bridge of ship, Research on seakeeping performance of a ship in nonlinear wave, Research on aerodynamics of an automobile in the real world, Assessment and prediction of ocean-atmosphere environment due to vehicle transportation, Research on an advanced technology of electrical energy generated by renewable energy (wind, ocean power, vibration) Research on a technology of energy harvesting Research on CFD technonogy by using Particle Based Method
Air Transportation and Ocean Systems	Professor Associate Professor Assistant Professor	Hidetsugu Iwashita Yuji Sakuno Naokazu Taniguchi	Research on the aerodynamic properties of WIG flying over the waves, Research on the passive control of the wind turbine with elastic composit material, Research on the human-powered aircraft, Research on the theoretical estimation of the seakeeping of high-speed ship, Research on the remote sensing technology of marine environment, Research on the acoustic tomography technology of marine environment
Geophysical Fluid System	Assistant Professor	Masazumi Arai	A study of influence of the Kuroshio on the state and variability of the Seto Inland Sea. A study of tidal mixing and tidal front. A study of the turbulent processes from planetary scale to microscale in a ocean. A study of the spontaneous transition between two states in a geophysical flow.

Architecture Program

Building Engineering Course

Laboratories	Staff		Education / Research Fields
Building Materials and Compornents	Professor Assistant Professor	Takaaki Okubo Atsushi Teramoto	Applying technologies of RFID for the building life-cycle support Durability design for reinforced concrete buildings Repairing method for buildings, materials and components for sustainable buildings Applying wireles sensor technology for maintenance of building elements Control technology of cracking in concrete Evaluation for aesthetic quality of concrete texture
Structural Mechanics of Building	Associate Professor	Takuro Mori	Study on large-scale wooden construction using wooden materials including CLT Research on development of wooden rigid frame structure Evaluating method of residual seismic performance of existing wooden construction Long term performance evaluation of wooden buildings and materials
Building Structures	Professor Assistant Professor	Hiroshi Tagawa Xingchen Chen	Seismic design of steel structures Vibration control system of steel structures Beam-to-column connections and column-bases of steel structures Buckling analysis and design of steel frames Seismic retrofit of existing structures
Disaster Prevention Engineering	Professor Associate Professor	Naohiro Nakamura Hiroyuki Miura	Seismic response and risk analyses of earthquake resistant, vibration controled and isolated buildings Estimation of soil-structure interaction effects shock-resistant design of buildings Earthquake ground motion evaluation Building damage estimation Spatial data analysis for risk evaluation and damage identification
Earthquake and Structural Engineering	Associate Professor	Yo Hibino	Seismic design of reinforced concrete members Seismic performance evaluation of reinforced concrete buildings Seismic retrofit and repairing methods of reinforced concrete buildings Damage estimation of reinforced concrete buildings

Architecture Course

Laboratories	Staff		Education / Research Fields
Urban and Architectural Planning	Professor Associate Professor Assistant Professor	Takahiro Tanaka Hideaki Sumikura Aya Ishigaki	Urban environmental planning (green, wind, water, climate, hazard, enerugy, and built environment). Compact city design with population decrease. Sustainable community design with using GIS. Housings in urban and local area. The planning of social welfare and community facilities. The region-based housing supply system. The planning and the management of building production processes.
Architectural History and Design Theory	Assistant Professor	Susumu Mizuta	Theory on peace architecture and urban design. Theory on environment and landscape design. History of modern architecture and modern urbanism in Japan and World. Research and planning for the conservation of buildings and towns.
Architectural Environment	Professor Associate Professor	Daisaku Nishina Sayaka Kindaichi	The planning of regional water environment, The efficient use of energy in buildings, The evaluation techniques for regional living environment and landscape, and The problems concerning with human behavior and/or environmental psychology.
Architectural Project	Associate Professor	Tetsuya Nakazono	Design of an environmentally conscious architecture Architectural design using BIM and CFD analysis Design of temporary shelters immediately after the disaster Study on wooden buildings using domestic solid wood

Faculty member below in charge of plural programs takes charge of the program in the following table, including Architecture Course of this program.

Staff		Other Program	Education / Research Fields
Associate Professor	Tetsu Kubota	Transdisciplinary Science and Engineering Program	Building and urban environmental science for achieving sustainable development in developing world.

Civil and Environmental Engineering Program

Laboratories	Staff		Education / Research Fields
Structural Materials and Concrete Structures	Professor Assistant Professor Assistant Professor	Kenji Kawai Yuko Ogawa Riya Catherine George	Education and research on the physicochemical characteristics of cementitious materials, the mechanical and durability performance evaluation of plain, reinforced and prestressed concretes, effective utilization of resources, environmental impact evaluation of concrete, and maintenance of concrete structures.
Structural Engineering	Professor Assistant Professor Assistant Professor	Kenichiro Nakarai Ichiro Ario Ho Si Lanh	Education and research on performance-based design on steel, concrete, and composite structures, earthquake and wind resistance design and vibration control, natural disaster prevention, remaining strength of aged deteriorated existing structures, maintenance and asset management of bridges, and various couputer simulation technologies.
Geotechnical Engineering	Professor Assistant Professor	Toshiro Hata Ryota Hashimoto	Evaluation of mechanical property of soft ground, Ground improvement techniques, Engineering properties of cement treated clay and and recycled geo-materials, Development of new construction technology for waste disposal facility in coastal areas, In-situ testing of weathered granite soil and the application on disaster prevention of natural slopes in heavy rainfall, Estimation and countermeasures of sand liquefaction by earthquakes, Evaluation of seismic site response of ground, Earthquake resistant design of geotechnical works, Maintenance and condition evaluation method for road pavement and geotechnical structures, Conservation of historic structures based on geotechnical engineering.
Infrastructure Management	Associate Professor	Naser Khaji	Structural analysis and simulation, damage identification and deterioration diagnosis of infrastructures
Global Environment and Planning	Associate Professor Associate Professor Assistant Professor	Makoto Tsukai Masaaki Fuse Lam Chi Yung	Development of planning methodology, and analysis for following themes; recycling and low-carbon society, urban transportation system by making full use of a economical evaluation, a statistical model, and a mathematical planning, a travel behavior model, or network scinence. Researches on material flows for scarce metals, market share forecast on low emission vehicles, development of statistical model for "big-data" , on consensus building by statistical approach for text data, and safety assessment for infrastructures.
Environmental Preservation Engineering	Professor Associate Professor Assistant Professor	Akiyoshi Ohashi Noriatsu Ozaki Tomonori Kindaichi	Biological wastewater treatment. Energy recovery from biomass by microbes. Nitrogen and Phosphorous removal . Microbial community analysis. Analysis and modelling of behavior of trace toxic chemicals in air and water environments. Application of membrane filtration technique on wastewater treatment.
Hydraulic Engineering	Associate Professor	Tatsuhiko Uchida	Numerical prediction model for floods Modeling of interactions among flood flow, vegetation and morphology in rivers Study on multi-scale phenomena of flow and sediment transport in a dynamic fluvial system Sedimentation in reservoirs and transport mechanism in gravel bed rivers Flow, sediment transport and topographical changes in rivers due to tsunami Multi-phase flows with sediment transport around river structures Study on measures to sediment-flood inundation and sediment capacity in rivers
Coastal Engineering	Associate Professor Associate Professor Assistant Professor	Kiyoshi Kawanishi Tadashi Hibino Shinya Nakashita	Acoustic measurement of wash road 2-D mapping of velocity and salinity fields using fluvial acoustic tomography Monitoring of ascending tsunami/tidal bore Development of technology to improve environment in river bank Practical use of "sediment microbial fuel cells" more than solar batteries Research on groundwater and tidal flat environment in tidal estuaries

Faculty members below in charge of plural programs take charge of the program in the following table, including this program.

Staff		Other Program	Education / Research Fields
Professor	Akimasa Fujiwara	Transdisciplinary Science and Engineering Program	Transportation planning methods, evaluation of transport policies, and sustainable development and transport
Professor	Zhang Junyi	Transdisciplinary Science and Engineering Program	Various urban, transportation, environment and energy, health, and tourism issues are targeted from the viewpoint of mobilities and urban policy. Relevant research deals with the development of methodologies (e.g., human behavior modeling, planning and evaluation methods), technological development, and policy evaluation and formulation for problem solving based on interdisciplinary approaches.
Associate Professor	Makoto Chikaraishi	Transdisciplinary Science and Engineering Program	Urban risk mangement / Advanced infrastrucrture planning / Activity-based analysis
Associate Professor	Lee Han Soo	Transdisciplinary Science and Engineering Program	Numerical models for coastal hazards・disaster prevention・mitigation, Renewable energy resource evaluation and management, Evaluation of climate changes impacts on natural hazards and renewable energy resource.
Assistant Professor	Zhang Runsen	Transdisciplinary Science and Engineering Program	Land use-transport interaction modelling, climate change and energy studies, low-carbon urban planning
Assistant Professor	Troselj Josko	Transdisciplinary Science and Engineering Program	Rainfall-induced and related river and ocean disasters

Informatics and Data Science Program

Laboratories	Staff		Education / Research Fields
Embedded Systems	Associate Professor	Yasuaki Ito	Research on hardware algorithm for combinatorial optimization using FPGAs, concurrent processing systems for big data, web-based lecture supporting system, and development of embedded systems.
Computer Systems	Professor Assistant Professor	Koji Nakano Daisuke Takafuji	Research on architectures and algorithmic techniques for new computation and network environments including programmable logic devises, GPU, network of workstations, and multi-core systems.
Distributed Systems	Professor Associate Professor	Satoshi Fujita Sayaka Kamei	Theory and practice on parallel and distributed systems, such as secure and efficient resource sharing schemes, real-time file exploration in wide area networks, high-performance computing using PC clusters, contents delivery in service providing networks, and environment monitoring systems based on wireless sensor networks.
Visual Information Science	Professor Associate Professor Associate Professor	Kazufumi Kaneda Toru Tamaki Bisser Raytchev	Computer graphics, visualization, image processing, image recognition and understanding, computer vision, machine learning, and various applications of these technologies, such as biomedical imaging, optical design, video surveillance and human-computer interaction.
Learning Engineering	Professor Associate Professor	Tsukasa Hirashima Yuusuke Hayashi	Research on technology-enhanced learning systems designed based on knowledge modeling, implemented with artificial intelligence, multimedia and web technologies, and then practiced from viewpoint of education and psychology.
Foundation of Computer Science	Professor Associate Professor Assistant Professor	Toru Nakanishi Teruaki Kitasuka Katsunobu Imai	Cryptography and information security. In particular, privacy-enhancing authentications and network services, and implementations based on elliptic curve cryptosystems. Mobile and ubiquitous computing. In particular, communication, activity recognition, and location sensing using wireless devices. Theoretical studies on future computing systems. In particular, cellular automata and reversible computing
Dependable Systems	Professor Professor	Tadashi Dohi Hiroyuki Okamura	Dependable computing, Fault tolerant computing, Computer security, Software reliability assessment, Performance evaluation, Reliability and Maintenance, Applied probability, Applied statistics, Operations research, Stochastic modeling.
Pattern Recognition	Professor Associate Professor	Takio Kurita Jun-ichi Miyao	Development of pattern recognition algorithms including deep learning. Image understanding, video recognition, image retrieval, etc. Real time processing for multimedia and embedded media software.
Social Computing	Professor	Yasuhiko Morimoto	Algorithm for processing and utilizing “big data”. Data mining for SNS, Web, IoT, GPS, etc. Database marketing, Privacy-preserving information retrieval. Linkage mining for Artificial General Intelligence (AGI).
Informatics and Mathmatical Science	Professor Professor Associate Professor	Chuzo Iwamoto Hiroaki Mukaidani Tadashi Shima	Computational complexity theory, hierarchies of complexity classes, and combinatorial computational geometry. System theory and intelligent information processing, Stabilization and optimization for stochastic systems, Numerical analysis and optimal design for mechatoronic systems. Stochastic processes, especially going around fractals. Spectral analysis of the generators associated with the stochastic processes on fractals.
Data Analytics and Modeling (schedule)	Professor	Koji Eguchi	Large-scale, complex and dynamic data analysis (including text analysis & information retrieval, network analysis, and financial data analysis).Probabilistic modeling, statistical inference, and machine learning (including Bayesian modeling and deep learning).
Information and Media Science	Professor Professor Associate Professor Associate Professor	Reiji Aibara Kouji Nishimura Tohru Kondo Takahiro Sumiya	Internet architecture, real-time video transmission technology, network security, network management, remote appliance control, information communication engineering, statistical growth model, information system supporting education and learning

Faculty members below in charge of plural programs take charge of the program in the following table, including this program.

Staff		Program	Education / Research Fields
Associate Professor	Mei Kodama	Transdisciplinary Science and Engineering Program	Research on Media Communication Services
Lecturer	Kazuo Iwasawa	Transdisciplinary Science and Engineering Program	Nuclear Theory, Information System
Assistant Professor	Hidenobu Watanabe	Transdisciplinary Science and Engineering Program	Cloud Computing, Cyber Security, Distributed System, Global Interoperability Management, Open Data
Assistant Professor	Syunya Suzuki	Transdisciplinary Science and Engineering Program	Internationalization technology for printing and document processing
Assistant Professor	Kouichi Tashima	Transdisciplinary Science and Engineering Program	Computer Network