

Courses	Research Fields	Faculty	Research Topics
Mechanical Engineering	Machine Design Engineering	(Prof.) Jun-ichi SHIBANO	Study on mechanical properties of bone and biomaterials. Non-destructive evaluation of solid materials using synchrotron radiation white X-ray.
		(Assoc. Prof.) Michihiro SATO	Mechanical property evaluation of metal material and human using numerical analysis.
		(Assoc. Prof.) Yutaka YOSHIDA	Evaluation of defects in materials using electron microscope
	Thermal Energy Engineering	(Prof.) Kazuhiro HAYASHIDA	Improvement of engine combustion technology and engine performance under low temperature conditions.
		(Prof.) Shinichi MORITA	Latent heat storage system, Heat transfer enhancement of fluid including nano-sized dispersoid
		(Prof.) Takanobu YAMADA	Heat transfer, μ GT co-generation system, Formation technology for gas hydrate
	Fluid Energy Engineering	(Assoc. Prof.) Kazunori TAKAI	Flow-Induced Vibration, Fluid-Structure Interactions.
		(Assoc. Prof.) Masanori MATSUMURA	Analysis of vortex structures and flow control in turbulent shear flows.
		(Assoc. Prof.) Yoichi MITO	Analysis of transport mechanisms in fluid turbulence using numerical simulation.
	Manufacturing Engineering	(Prof.) Sharif ULLAH	3D Printing, Industry 4.0, Precision Machining, Sustainable Product Development
	Computational Intelligence and Biomechanical Engineering	(Prof.) Yohei HOSHINO	Study on vibration analysis and control for higher efficiency mechanical systems and application of robot technology
(Assoc. Prof.) Michiko WATANABE		Emergence on autonomous behavior and acquisition of knowledge episode for autonomous agents.	

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Civil and Environmental Engineering	Structural Engineering and Structural Materials	(Assoc. Prof.) Masumi INOUE	Study on durability and workability of cold weather concrete.
		(Assoc. Prof.) Takehiko SAITOU	Study on seismic isolation devices and disaster prevention in cold regions.
		(Assoc. Prof.) Heesup CHOI	Study on behavior prediction and self-healing of cracks in concrete structure.
		(Assoc. Prof.) Yasunori MIYAMORI	Safety and sustainability of infrastructures.
	Geotechnical and Underground Space Engineering	(Prof.) Takayuki KAWAGUCHI	Geotechnical structures and ground behavior in cold regions.
		(Prof.) Satoshi YAMASHITA	Evaluation of stress-strain testing of geomaterial.
		(Assoc. Prof.) Shunzo KAWAJIRI	Research on Geo-disaster prevention technology considering regional conditions
		(Assoc. Prof.) Dai NAKAMURA	Study on changes in physical properties of rock due to freeze.
	Mobility Management Engineering	(Prof.) Kiyoshi TAKAHASHI	Evaluation of transportation project.
		(Assoc. Prof.) Kazuya TOMIYAMA	Human factor-based evaluation of transportation infrastructure
	Hydraulic Engineering	(Prof.) Hiroshi HAYAKAWA	Researches on runoff process and river geomorphology.
		(Prof.) Yasuharu WATANABE	Channel formation process and river disaster prevention.
		(Assoc. Prof.) Katsuaki KOMAI	Water and wastewater treatment. Material dynamics in water environment.
		(Assoc. Prof.) Yasuhiro YOSHIKAWA	Study on flood control, water-utilization and environment of river in cold regions.
	Glaciology and Gas Hydrate Engineering	(Prof.) Takao KAMEDA	Clarifying the mechanism relating to snow and ice (snow crystals, blowing snow and curling stone etc.), and cold temperatures in Japan and the Antarctic
		(Prof.) Akihiro HACHIKUBO	Thermal properties of snow, ice and gas hydrate.
		(Assoc. Prof.) Hiroshi OHNO	Physicochemical properties of ice and gas hydrate
		(Assoc. Prof.) Tatsuo SHIRAKAWA	Changes in snow and ice environments associated with climate change and its impact on transport.
		(Assoc. Prof.) Kazutaka TATEYAMA	Glaciological studies in the ice covered seas using satellite and in-situ data.
		(Assoc. Prof.) Akira HORI	Environmental conservation and physical properties of ice in cold regions.

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Electrical and Electronic Engineering	Electromagnetic Energy Engineering	(Prof.) Junji TAMURA	Design and analysis of wind energy conversion system, Analysis of power system dynamics, Analysis and control of rotating electrical machines.
		(Assoc. Prof.) Atsushi UMEMURA	Design and analysis of wind energy conversion system, Analysis of power system dynamics, Analysis and control of rotating electrical machines. Control of power electronic equipments.
		(Assoc. Prof.) Rion TAKAHASHI	Design and analysis of wind energy conversion system, Analysis of power system dynamics, Analysis and control of rotating electrical machines.
	Electric Power Systems Engineering	(Prof.) Shinya OBARA	Distributed power supply, Compound energy system, Optimal design, Operation plan.
	Electrical and Electronic Application Engineering	(Prof.) Kenji KUROKAWA	Reliability of optical fiber when exposed to high-power light for ultra high capacity optical communication
		(Prof.) Hiroyuki SHIBATA	Development of superconducting sensor and its application
		(Assoc. Prof.) Takeshi KAWAMURA	Stability analysis and synthesis for control system, Robotics, Intelligent Transport Systems(ITS), and Forest Engineering.
		(Assoc. Prof.) Daisuke SAKAI	Holography, Optical property around transparent medium, Display technique for optical information.
		(Assoc. Prof.) Yasunari HASHIMOTO	Development of brain-machine interface based on sensorimotor function in humans and its clinical application.
	Communication Engineering	(Prof.) Tatsuya KASHIWA	Numerical analysis of microwave circuits and antennas, Analysis of digital communication systems.
		(Assoc. Prof.) Kenji TAGUCHI	Study on biomedical EMC and optimal design of electromagnetic device using numerical simulation
		(Assoc. Prof.) Shingo YOSHIZAWA	Underwater acoustic communication and localization.
	Wave Electronics	(Prof.) Koichi HIRAYAMA	Research on numerical analysis and design of optical and microwave waveguide devices.
		(Assoc. Prof.) Jun-ichiro SUGISAKA	Hybrid artificial intelligence using holograms and computers, design of computer-generated hologram, and application of numerical scattering simulation
		(Assoc. Prof.) Takashi YASUI	Numerical analysis and design of optical waveguide devices.
	Integrated Electronics	(Prof.) Mayumi TAKEYAMA	Thin-films for electronics, LSI process engineering, physics and chemistry for metal/semiconductor interfaces.
		(Assoc. Prof.) Masaru SATO	2.5D/3D LSI process engineering

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Computer Sciences	Intelligent System Design	(Prof.) Toshio EISAKA	Control system design and its application. Robot Informatics.
		(Prof.) Masakiyo SUZUKI	Sensor array signal processing, Acuity in ranging based on FM-FM neurons in the auditory cortex of mustached bats, Design of information management systems
		(Assoc. Prof.) Ikuo SUZUKI	Emergence of information based on complex systems.
	Optics and Image Science	(Prof.) Kenji HARADA	Holographic recording using organic materials and its application.
		(Prof.) Noriaki MIURA	Development of image restoration methods.
		(Assoc. Prof.) Hiroyasu SONE	Optical information processing using optical device.
		(Assoc. Prof.) Yasuhiro HARADA	Optical instrumentation and manipulation of micro objects based on light scattering phenomena and its application.
	Smart Engineering of Knowledge Discovery and Data Mining	(Prof.) Yasunari MAEDA	Knowledge information processing and its applications.
		(Prof.) Hiroshi MASUI	Study of scientific database and application.
		(Prof.) Fumito MASUI	Natural Language Processing and its application, Curling Informatics and Tourism Informatics.
		(Assoc. Prof.) Yoshihiko HAYAKAWA	Medical 3D visualization and the application, Computer-aided detection and recognition in medical imaging.
		(Assoc. Prof.) Michal Edmund PTASZYNSKI	General: Natural Language Processing, Artificial Intelligence, Affective Computing, Specific: Cyberbullying Detection, Depression Detection, Affect Analysis, Ainu Language Processing
	Mathematical and Computational Science	(Prof.) Okihiro SAWADA	Theories of Partial Differential Equations
		(Prof.) Hiroshi YAMADA	Lie algebras and singularities.
		(Assoc. Prof.) Yuichi KABAYA	Hyperbolic geometry and topology.
		(Assoc. Prof.) Kazunori MATSUDA	Commutative ring theory and Combinatorics

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Biotechnology and Environmental Chemistry	Biotechnology and Food Engineering	(Prof.) Hirofumi ARAI	Suppression of allergy by food factors.
		(Prof.) Masaaki KONISHI	Investigation and application for environmental microorganisms, development of bioprocess.
		(Prof.) Takashi YOSHIDA	Chemical synthesis of polysaccharides having specific biological activity. Elucidation of structure and biological activity relationship of natural polysaccharides. Synthesis of biological dendrimers. Bioethanol. Enzymatic polymerization. Zeroemission.
		(Assoc. Prof.) Toru KANNO	Application of ceramic material to biomaterial and environmental material.
		(Assoc. Prof.) Toshitsugu SATO	Molecular breeding of edible mushrooms (shiitake mushroom etc.), and analysis of agricultural products fermented by mushrooms
		(Assoc. Prof.) Kazuyuki HATTORI	Synthesis and analysis of biomolecules, especially carbohydrates and carbohydrate polymers.
	Resource and Environment Chemistry	(Prof.) Tohru SAITOH	Development of separation methods for environmental analysis, environmental technology, and resource recovery.
		(Prof.) Masayuki HOSHI	Regio-, stereo-, and chemo-selective transformation of organic compounds.
		(Assoc. Prof.) Noriyasu OKAZAKI	Environmental catalysis
		(Assoc. Prof.) Yasumasa KANEKIYO	Design and synthesis of stimuli-responsive molecular recognition systems.
		(Assoc. Prof.) Yasutaka SHIMOTORI	Stereoselective synthesis of functional organic compounds.
		(Assoc. Prof.) Kensuke MIYAZAKI	Development of environmentally friendly polymer materials.

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Materials Science and Engineering	Advanced Materials Chemistry	(Prof.) Hirotugu MINAMI	Development of analytical methods for the determination of trace elements in material and environmental samples.
		(Prof.) Miki MURATA	Synthesis of organoboron and - silicon compounds by transition - metal - catalyzed coupling reactions.
		(Prof.) Shinji WATANABE	Synthesis of aromatic polyester and polyether. Synthesis of polymer microsphere having mercapto groups.
		(Assoc. Prof.) Masayuki UTO	Design and development of chemical sensors mimicking biological functions.
		(Assoc. Prof.) Takeshi NAMIKOSHI	Synthesis of functional polymeric materials by living polymerization.
	Advanced Materials Engineering	(Prof.) Yoshio ABE	Formation and characterization of thin films. Electrochemical devices.
		(Prof.) Naohumi OHTSU	Development of biofunctional metallic implants for medical application, Analysis of bio/biomaterial interface reaction
		(Prof.) Tomoya OHNO	Deposition of piezoelectric thin films by Chemical Solution Deposition. Nano-coating of inorganic materials by Chemical Solution Deposition.
		(Prof.) Midori KAWAMURA	Stability of thin film structures improved by surface & interface nanolayers. Energy-saving devices.
		(Prof.) Takeshi MATSUDA	Development of catalysts for effective utilization of natural resources.
		(Assoc. Prof.) Kim Kyung Ho	Optoelectronic devices based on nanostructures.
		(Assoc. Prof.) Shigeto HIRAI	Development and characterization of electrocatalysts for the activation of next generation energy conversion technologies
		(Assoc. Prof.) Hiroaki FURUSE	Development of transparent laser ceramics