

## Doctoral Program Faculty, Graduate School of Engineering, Kitami Institute of Technology

Academic Year 2020

Courses	Research Fields	Faculty	Research Topics
Manufacturing Engineering	Materials Manufacturing Engineering	(Prof.) Yoshio ABE	Formation of oxide and nitride thin films by sputtering. Electrochemical properties of thin films.
		(Prof.) Hirofumi ARAI	Suppression of allergy by food factors.
		(Prof.) Sharif ULLAH	3D Printing, Industry 4.0, Precision Machining, Sustainable Product Development
		(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.) Kenji KUROKAWA	Reliability of optical fiber when exposed to high-power light for ultra high capacity optical communication
		(Prof.) Tohru SAITOH	Design of highly efficient separation systems in analytical, environmental, and resource technologies.
		(Prof.) Hiroyuki SHIBATA	Development of superconducting sensor and its application
		(Prof.) Mayumi TAKEYAMA	Thin-films for electronics. LSI process engineering. Physics and chemistry for metal/semiconductor interfaces.
		(Prof.) Kazuhiro HAYASHIDA	Improvement of engine combustion technology and engine performance under low temperature conditions.
		(Prof.) Masayuki HOSHI	Regio-, stereo-, and chemo-selective transformation of organic compounds.
		(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.) Shinichi MORITA	Latent heat storage system, Heat transfer enhancement of fluid including nano-sized dispersoid
		(Prof.) Shinji WATANABE	Synthesis of aromatic polyester and polyether. Synthesis of polymer microsphere having mercapto groups.
		(Assoc. Prof.) Kim Kyung Ho	Optoelectronic devices based on nanostructures.
		(Assoc. Prof.) Masaru SATO	2.5D/3D LSI process engineering
		(Assoc. Prof.) Yasutaka SHIMOTORI	Stereoselective synthesis of functional organic compounds.
		(Assoc. Prof.) Kazunori TAKAI	Flow-Induced Vibration, Fluid-Structure Interactions.
		(Assoc. Prof.) Takeshi NAMIKOSHI	Synthesis of functional polymeric materials by living polymerization.
(Assoc. Prof.) Hiroaki FURUSE	Development of transparent laser ceramics		
(Assoc. Prof.) Yoichi MITO	Analysis of transport mechanisms in fluid turbulence using numerical simulation.		

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Manufacturing Engineering	Manufacturing System Engineering	(Prof.) Toshio EISAKA	Control system design and its application. Robot Informatics.
		(Prof.) Tatsuya KASHIWA	Numerical analysis of microwave circuits and antennas. Analysis of digital communication systems.
		(Prof.) Okihiro SAWADA	Theories of Mathematical Fluid Dynamics
		(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
		(Prof.) Kiyoshi TAKAHASHI	Evaluation of transportation project.
		(Prof.) Kenji HARADA	Holographic recording using organic materials and its application.
		(Prof.) Koichi HIRAYAMA	Research on numerical analysis and design of optical and microwave waveguide devices.
		(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.
		(Prof.) Noriaki MIURA	Development of image restoration methods and their applications.
		(Prof.) Hiroshi YAMADA	Lie ring and singular points.
		(Assoc. Prof.) Yuichi KABAYA	Hyperbolic geometry and topology.
		(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.) Jun-ichiro SUGISAKA	Hybrid artificial intelligence using holograms and computers, design of computer-generated hologram, and application of numerical scattering simulation
		(Assoc. Prof.) Ikuo SUZUKI	Emergence of information based on complex systems.
		(Assoc. Prof.) Hiroyasu SONE	Optical information processing using optical device.
		(Assoc. Prof.) Kenji TAGUCHI	Study on biomedical EMC and optimal design of electromagnetic device using numerical simulation
		(Assoc. Prof.) Kazuya TOMIYAMA	Human factor-based evaluation of transportation infrastructure
		(Assoc. Prof.) Michal Edmund PTASZYNSKI	<b>General:</b> Natural Language Processing, Artificial Intelligence, Affective Computing, <b>Specific:</b> Cyberbullying Detection, Depression Detection, Affect Analysis, Ainu Language Processing
		(Assoc. Prof.) Kazunori MATSUDA	Commutative ring theory and Combinatorics
		(Assoc. Prof.) Takashi YASUI	Numerical analysis and design of optical waveguide devices.
(Assoc. Prof.) Shingo YOSHIKAWA	Underwater acoustic communication and localization.		

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Cold Regions, Environmental and Energy Engineering	Cold Regions 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.) Takayuki KAWAGUCHI	Geotechnical structures and ground behavior in cold regions.
		(Prof.) Hiroshi HAYAKAWA	Researches on runoff process and river geomorphology.
		(Prof.) Satoshi YAMASHITA	Evaluation of stress-strain testing of geomaterial.
		(Prof.) Yasuharu WATANABE	Channel formation process and river disaster prevention.
		(Assoc. Prof.) Masumi INOUE	Study on durability and workability of cold weather concrete.
		(Assoc. Prof.) Hiroshi OHNO	Physicochemical properties of ice and gas hydrate
		(Assoc. Prof.) Shunzo KAWAJIRI	Research on Geo-disaster prevention technology considering regional conditions
		(Assoc. Prof.) Katsuaki KOMAI	Water and wastewater treatment. Material dynamics in water environment.
		(Assoc. Prof.) Takehiko SAITO	Study on seismic isolation devices and disaster prevention in cold regions.
		(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.) Heesup CHOI	Study on behavior prediction and self-healing of cracks in concrete structure.
		(Assoc. Prof.) Dai NAKAMURA	Study on changes in physical properties of rock due to freeze.
		(Assoc. Prof.) Akira HORI	Environmental conservation and physical properties of ice in cold regions.
		Cold Regions, Environmental and Energy Engineering	Environmental and Energy Engineering
(Assoc. Prof.) Yasuhiro YOSHIKAWA	Study on flood control, water-utilization and environment of river in cold regions.		
(Prof.) Shinya OBARA	Distributed power supply, Compound energy system, Optimal design, Operation plan.		
(Prof.) Masaaki KONISHI	Investigation and application for environmental microorganisms, development of bioprocess.		
(Prof.) Junji TAMURA	Design and analysis of wind energy conversion system, Analysis of power system dynamics, Analysis and control of rotating electrical machines.		
(Prof.) Akihiro HACHIKUBO	Formation processes and thermal properties of snow, ice and gas hydrate.		
(Prof.) Takeshi MATSUDA	Development of catalysts for effective utilization of natural resources.		
(Prof.) Takanobu YAMADA	Heat transfer, Co-generation system.		
(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.) Noriyasu OKAZAKI	Environmental Catalysis		
(Assoc. Prof.) Rion TAKAHASHI	Design and analysis of wind energy conversion system, Analysis of power system dynamics, Analysis and control of rotating electrical machines.		
(Assoc. Prof.) Shigeto HIRAI	Development and characterization of electrocatalysts for the activation of next generation energy conversion technologies		

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Medical Engineering	Biomechanical and Biomedical Engineering	(Prof.) Naofumi OHTSU	Development of biofunctional metallic implants for medical application, Analysis of bio/biomaterial interface reaction
		(Prof.) Jun-ichi SHIBANO	Study on mechanical properties of bone and biomaterials. Non-destructive evaluation of solid materials using synchrotron radiation white X-ray.
		(Prof.) Yohei HOSHINO	Study on vibration analysis and control for higher efficiency mechanical systems and application of robot technology
		(Prof.) Takashi YOSHIDA	Chemical synthesis of polysaccharides having specific biological activity. Elucidation of structure and biological activity relationship of natural polysaccharides. Enzymatic polymerization. Zero emission.
		(Assoc. Prof.) Yasumasa KANEKIYO	Design and synthesis of stimuli-responsive molecular recognition systems.
		(Assoc. Prof.) Toru KANNO	Application of ceramic material to drug-release material and biomaterial.
		(Assoc. Prof.) Toshitsugu SATO	Molecular breeding of edible mushrooms (shiitake mushroom etc.), and analysis of agricultural products fermented by mushrooms
		(Assoc. Prof.) Michihiro SATO	Digital modeling and mechanical simulation of human.
		(Assoc. Prof.) Yasunari HASHIMOTO	Development of brain-machine interface based on sensorimotor function in humans and its clinical application.
		(Assoc. Prof.) Kazuyuki HATTORI	Synthesis and analysis of biomolecules, especially carbohydrates and carbohydrate polymers.
		(Assoc. Prof.) Yoshihiko HAYAKAWA	Medical 3D visualization and the application, Computer-aided detection and recognition in medical imaging.
		(Assoc. Prof.) Kensuke MIYAZAKI	Development of environmentally friendly polymer materials.
		(Assoc. Prof.) Yutaka YOSHIDA	Evaluation of damage in materials, Study on mechanical properties of biomaterials.
		(Assoc. Prof.) Michiko WATANABE	Emergence on autonomous behavior and acquisition of knowledge episode for autonomous agents.