

Master's Program Faculty, Graduate School of Engineering, Kitami Institute of Technology

Engineering

Academic Year 2026

Programs	Research Fields	Faculty	Research Topics
Data Science	Data Science	(Prof.) URA Sharifu	3D Printing, Industry 4.0, Remanufacturing, Sustainable Product Development
		(Prof.) KONISHI Masaaki	Artificial intelligence technology in applied microbiology, biochemical engineering and process engineering.
		(Prof.) SAWADA Okihiro	Research on probability densities and stochastic partial differential equations from Mathematics and Statistics
		(Prof.) XIE WEI	Research on control theory and its application, observer design and robust control
		(Prof.) SONE Hiroyasu	Optical information transmission device using data science technology.
		(Prof.) TOMIYAMA Kazuya	Road Asset Management based on Surface Informatics, Road and Transportation Assessment with Physiopsychological Information based on the Life-centered Design
		(Prof.) PTASZYNSKI Michal Edmund	Applications of Data Science, Generative AI, and Natural Language Processing to Real-World Problems (Natural Language Processing, Artificial Intelligence, Affective Computing, Cyberbullying and Online Harms Detection, Revitalization of Endangered Languages)
		(Prof.) HOSHINO Yohei	Application of AI and digital transformation to smart agriculture, application of AI to sports motion analysis and skill analysis, and application and development of other data analysis methods
		(Prof.) MASUI Hiroshi	Development of bus location system and data analysis based on public transportation open data, optimization of cloud-based collaboration platform using machine learning, utilization and analysis of academic information databases.
		(Prof.) MASUI Fumito	Tactical analysis and motion analysis in curling using data scientific approach, development of advanced curling AI based on actual game data, tourism informatics focusing on content tourism using data scientific approach
		(Prof.) MIURA Atsushi	Molecular behavior analysis and crystallization control via optical tweezers – microspectroscopy; Spectroscopic informatics based on spectroscopic measurement, data analysis, and machine learning; and Spectroscopic informatics-based smart agriculture
		(Assoc. Prof.) YU Yating	Research on mind-body stress assessment and reduction methods, Stress coping design for achieving work-life balance, Research on improving production efficiency in labor-intensive work
		(Assoc. Prof.) UENISHI Toru	The optimization and efficiency improvement of machine and plant systems, mechanical design, control, and material composition can be achieved through data-driven and image analysis
		(Assoc. Prof.) KABAYA Yuichi	Mathematics, Topology, persistent homology
		(Assoc. Prof.) KAWAGUCHI Yusuke	Analysis of the atmosphere–sea ice–ocean coupled system and its impacts on the climate system
		(Assoc. Prof.) KAWAMURA Takeshi	Research on information data utilization method and implementation using RFID system in ITS and forestry field.
		(Assoc. Prof.) KIRIHARA Takanobu	Formation and evolution of nearby galaxies by parallel numerical simulations of galaxy mergers and big data analysis.
		(Assoc. Prof.) KONDO Hiroko	Application of machine learning methods for the analysis of sequence-structure-function relationships in proteins, database construction and web application development
		(Assoc. Prof.) SHIBUKAWA Genki	Deep learning (various integrals, iterative calculation of series), special functions of matrix variables, symmetric functions
		(Assoc. Prof.) SHIBUYA Takatoshi	Astronomical image processing using artificial intelligence, Statistical analysis of big data on distant galaxies
		(Assoc. Prof.) SUGISAKA Jun-ichiro	Development of massively parallel pattern recognition system using light wave diffraction and development of programming language for electromagnetic field analysis and machine learning.
		(Assoc. Prof.) SUZUKI Ikuo	Emergence of information based on complex systems.
		(Assoc. Prof.) TAKEKOSHI Tatsuya	Scientific research on radio astronomy using data science approaches, and development of observational data analysis methods
		(Assoc. Prof.) TATEYAMA Kazutaka	Monitoring and future prediction of ice-covered sea environmental using satellite remote sensing and field observation data, forecasting of outstanding scenery occurrence using environmental data
		(Assoc. Prof.) JEONG ILWON	Study on elucidating the interaction structure of coastal environments using data science and developing predictive models for environmental change

Programs	Research Fields	Faculty	Research Topics
Data Science	Data Science	(Assoc. Prof.) NAKAMURA Fumihiko	Research on dynamical systems for the mathematical understanding of dynamic phenomena and its application to real data
		(Assoc. Prof.) MATSUDA Kazunori	Research on invariants of connected simple graphs using Python programming
		(Assoc. Prof.) RAVANKAR Abhijeet	Study of autonomous mobile robots, Artificial Intelligence (AI), Deep Learning, Machine Learning, Computer Vision, Robotics & AI in service, automation, and healthcare.
		(Assoc. Prof.) WATANABE Tatsuya	Ground deformation monitoring using satellite data and landslide topography interpretation using deep learning.
Information and Communication Engineering	Wave Informatics and Communications	(Assoc. Prof.) SUGISAKA Jun-ichiro	Hybrid artificial intelligence using holograms and computers, design of computer-generated hologram, and application of numerical scattering simulation
		(Assoc. Prof.) TAGUCHI Kenji	Study on biomedical EMC and optimal design of electromagnetic device using numerical simulation
	Information Science	(Prof.) XIE WEI	Research on control theory and its application, observer design and robust control
		(Prof.) PTASZYNSKI Michal Edmund	Applications of Data Science, Generative AI, and Natural Language Processing to Real-World Problems (Natural Language Processing, Artificial Intelligence, Affective Computing, Cyberbullying and Online Harms Detection, Revitalization of Endangered Languages)
		(Prof.) MAEDA Yasunari	Knowledge information processing and its applications.
		(Prof.) MASUI Hiroshi	Development of bus location system and data analysis based on public transportation open data, optimization of cloud-based collaboration platform using machine learning, utilization and analysis of academic information databases.
		(Prof.) MASUI Fumito	Natural Language Processing and its application, Curling Informatics and Tourism Informatics.
		(Assoc. Prof.) Eronen Juuso Kalevi Kristian	Data Science, Natural Language Processing, Cross-lingual transfer learning
		(Assoc. Prof.) KAWAMURA Takeshi	Stability analysis and synthesis for control system, Robotics, Intelligent Transport Systems(ITS), and Forest Engineering.
		(Assoc. Prof.) KIRIHARA Takanobu	Numerical astronomy, Nearby Universe, Formation and evolution of galaxies, Big data analysis for astronomy
	Information Optics	(Prof.) KUROKAWA Kenji	Reliability of optical fiber when exposed to high-power light for ultra high capacity optical communication
		(Prof.) SONE Hiroyasu	Optical information processing using optical device.
		(Prof.) HARADA Kenji	Natural optical phenomena, information photonics and development of optical educational materials.
		(Assoc. Prof.) SAKAI Daisuke	Holography, Optical property around transparent medium, Display technique for optical information.
		(Assoc. Prof.) SHIBUYA Takatoshi	Extragalactic Astronomy, Observational Astronomy, Early Universe, Big Data Analysis, Digital Image Processing, Artificial Intelligence
		(Assoc. Prof.) TAKEKOSHI Tatsuya	Research on cosmic star formation, and the development of submillimeter instruments and data analysis methods
	Mathematical Science	(Prof.) SAWADA Okihiro	Theories of Partial Differential Equations
		(Assoc. Prof.) KABAYA Yuichi	Hyperbolic geometry and topology.
		(Assoc. Prof.) SHIBUKAWA Genki	Mathematics and numerics of various transformations and expansions, fast Fourier transform, Chebyshev expansion
		(Assoc. Prof.) TOYOKAWA Hisayoshi	Ergodic theory
		(Assoc. Prof.) NAKAMURA Fumihiko	Ergodic theory and Random dynamical systems
(Assoc. Prof.) MATSUDA Kazunori		Commutative ring theory and Combinatorics	

Programs	Research Fields	Faculty	Research Topics
Mechanical and Electrical Engineering	Thermal and Fluid Energy Engineering	(Prof.) SEGAWA Takehiko	Aerodynamic drag reduction in mobility by active flow control. Plasma-based fluid application technology.
		(Prof.) HAYASHIDA Kazuhiro	Improvement of engine combustion technology and engine performance under low temperature conditions.
		(Prof.) MORITA Shinichi	Latent heat storage system, Heat transfer enhancement of fluid including nano-sized dispersoid
		(Assoc. Prof.) UENISHI Toru	Carbon dioxide capture and recycling technology, Fuel cells, Exhaust gas aftertreatment systems
		(Assoc. Prof.) TAKAI Kazunori	Flow-Induced Vibration, Fluid-Structure Interactions.
		(Assoc. Prof.) MITO Yoichi	Analysis of transport mechanisms in fluid turbulence using numerical simulation.
	Electrical and Chemical Energy Engineering	(Prof.) OHNO Tomoya	All solid state Li-ion battery. Ceramis Nano-coating on Nano-particles.
		(Prof.) OBARA Shinya	Hydrogen energy, Distributed power supply, Microgrid, Gas hydrate power system, Operation planning.
		(Prof.) TAKEYAMA Mayumi	3D-Integration, Ultra-power-saving next-generation device
		(Prof.) HIRAI Shigeto	Development and characterization of electrocatalysts for the activation of next generation energy conversion technologies
		(Assoc. Prof.) UMEMURA Atsushi	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.) SAKAGAMI Hiroto	Manufacture of turquoise hydrogen and nanocarbon, Study on effective utilization of underutilized energy resources
		(Assoc. Prof.) SATO Masaru	2.5D/3D LSI process engineering
		(Assoc. Prof.) TAKAHASHI Rion	Design and analysis of wind energy conversion system, Analysis of power system dynamics, Analysis and control of rotating electrical machines.
		(Assoc. Prof.) YASUI Takashi	Numerical analysis and design of optical waveguide devices.
	Design and Manufacturing Systems Engineering	(Prof.) URA Sharifu	3D Printing, Industry 4.0, Remanufacturing, Sustainable Product Development
		(Prof.) YOSHIDA Yutaka	Evaluation of defects in materials using electron microscope
		(Assoc. Prof.) OKUYAMA Yelm	Sports Engineering or the Evaluation for Mechanical Properties of Metallic Materials Using Computational Mechanics
		(Assoc. Prof.) KAWANO Yoshiki	Development of numerical methods and systems to evaluate mechanical properties in materials and their application to metals and bones
	Computational Intelligence and Biomechanical Systems Engineering	(Prof.) OKUMURA Takashi	Artificial intelligence in medicine Public health informatics Health crisis management Policy assessment for healthcare information systems
		(Prof.) HOSHINO Yohei	Study on vibration analysis and control for higher efficiency mechanical systems and application of robot technology
		(Assoc. Prof.) KAGAYA Katsushi	Cybernetics and biomimetics of organisms as adaptive systems evolved in extreme and real environments
		(Assoc. Prof.) KANEKIYO Yasumasa	Design and synthesis of stimuli-responsive molecular recognition systems.
		(Assoc. Prof.) SUZUKI Ikuo	Emergence of information based on complex systems.
		(Assoc. Prof.) RAVANKAR Abhijeet	Study of autonomous mobile robots, Artificial Intelligence (AI), Deep Learning, Machine Learning, Computer Vision, Robotics & AI in service, automation, and healthcare.

Programs	Research Fields	Faculty	Research Topics
Civil and Environmental Engineering	Structural Engineering and Structural Materials	(Prof.) INOUE Masumi	Study on durability and workability of cold weather concrete.
		(Prof.) CHOI Heesup	Study on behavior prediction and self-healing of cracks in concrete structure.
		(Assoc. Prof.) KADOTA Takanori	Study on design and maintenance of bridge structures
		(Assoc. Prof.) SAITO Takehiko	Study on seismic isolation devices and disaster prevention in cold regions.
	Geosphere Engineering	(Prof.) KAWAGUCHI Takayuki	Study on ground behavior in cold regions and ground reinforcement.
		(Prof.) NAKAMURA Dai	Study on changes in physical properties of rock due to freeze.
		(Assoc. Prof.) WATANABE Tatsuya	Study on periglacial processes and mass movement.
	Mobility Management Engineering	(Prof.) TAKAHASHI Kiyoshi	Evaluation of transportation project.
		(Prof.) TOMIYAMA Kazuya	Evaluation of transportation infrastructure based on the Life-centered Design Approach
	Hydraulic Engineering	(Prof.) KOMAI Katsuaki	Modeling on water resources management, water pollution, aquatic ecosystem, and blue carbon
		(Prof.) YOSHIKAWA Yasuhiro	Study on flood control, water-utilization and environment of river in cold regions.
		(Assoc. Prof.) SHIRAI Hidekazu	Study on waves and current flows in estuarine and coastal regions.
		(Assoc. Prof.) JEONG ILWON	Study on material cycling and restoration in coastal benthic environments
	Glaciology and Gas Hydrate Engineering	(Prof.) KAMEDA Takao	Clarifying the impact of global warming on the Cryosphere (lake ice, snow depth and etc.), research on curling (analysis of trajectory of a curling stone, clarifying the sweeping mechanism), study on the stalagmites in Hyakujoujiki Cave, Hokkaido, Japan
		(Prof.) KIDA Masato	Study on clathrate hydrate-based technologies
		(Prof.) HACHIKUBO Akihiro	Thermal properties of snow, ice and gas hydrate.
		(Prof.) MINAMI Hirotsugu	Development of analytical methods for the determination of trace elements in material and environmental samples.
		(Assoc. Prof.) OHNO Hiroshi	Physicochemical properties of ice and gas hydrate
		(Assoc. Prof.) KAWAGUCHI Yusuke	Analysis of the atmosphere–sea ice–ocean coupled system and its impacts on the climate system
		(Assoc. Prof.) SHIRAKAWA Tatsuo	Changes in snow and ice environments associated with climate change and its impact on transport.
(Assoc. Prof.) TATEYAMA Kazutaka		Study on the ice covered seas environment using satellite and in-situ data.	
(Assoc. Prof.) HORI Akira		Environmental conservation and physical properties of ice in cold regions.	

Programs	Research Fields	Faculty	Research Topics
Applied Chemistry	Advanced Materials Chemistry	(Prof.) ABE Shigeaki	Development of novel medical/biomaterials based on organic, inorganic, and composite materials
		(Prof.) MIURA Atsushi	Molecular behavior analysis and crystallization control via optical tweezers–microspectroscopy; Spectroscopic informatics based on spectroscopic measurement, data analysis, and machine learning; and Spectroscopic informatics–based smart agriculture
		(Prof.) MURATA Miki	Synthesis of organoboron and - silicon compounds by transition - metal - catalyzed coupling reactions.
		(Prof.) WATANABE Shinji	Synthesis of aromatic polyester and polyether. Synthesis of polymer microsphere having mercapto groups.
		(Assoc. Prof.) KOHARI Yoshihito	Synthesis of biologically active compounds using organocatalysts
	Advanced Materials Engineering	(Prof.) OHTSU Naohumi	Development of biofunctional metallic implants for medical application, Analysis of bio/biomaterial interface reaction
		(Prof.) KAWAMURA Midori	Preparation and application of black metal films, Development of ultra-pure metal film deposition process, High-performance thin-film materials utilizing nanolayers
		(Prof.) KIBA Takayuki	Development and characterization of metal/semiconductor nanostructured materials and their application to optical devices
		(Prof.) KIM Kyung Ho	Optoelectronic devices based on nanostructures.
		(Prof.) SHIBATA Hiroyuki	Development of superconducting sensor and its application
	Biotechnology and Food Engineering	(Prof.) ARAI Hirofumi	Suppression of allergy and inflammation by food factors using cell lines.
		(Prof.) KONISHI Masaaki	Investigation and application for environmental microorganisms, development of bioprocess.
		(Assoc. Prof.) CHIOU Tai-Ying	Analysis and application of food microorganisms, and development of novel fermented food materials.
		(Assoc. Prof.) KONDO Hiroko	Computational biophysics and bioinformatics
		(Assoc. Prof.) FENG Chaohui	Development of an innovative meal added with flavonoids extracted from waste citrus peels and quality evaluation by using non-invasive detection
		(Assoc. Prof.) YOKAWA Ken	Bioengineering of plant environmental adaptation and metabolism
	Resource and Environment Chemistry	(Assoc. Prof.) SHIMOTORI Yasutaka	Stereoselective synthesis of functional organic compounds and evaluation of their properties.
		(Assoc. Prof.) HATTORI Kazuyuki	Synthesis and analysis of biomolecules, especially carbohydrates and carbohydrate polymers.
(Assoc. Prof.) MIYAZAKI Kensuke		Development of environmentally friendly polymer materials.	

Programs	Research Fields	Faculty	Research Topics
Management Engineering	Research and Development System	(Prof.) UCHIJIMA Fumiko	Industry/Academia/Government cooperation, Corporate identity, Public relations
		(Assoc. Prof.) SAEGUSA Atsuhiko	Intellectual property
	Management for Social Implementation	(Assoc. Prof.) YU Yating	Methods proposed for employee productivity improvement from the viewpoint of industrial engineering
		(Assoc. Prof.) TANG YI	Underwater image enhancement via generation AI. A pre-disaster prevention and analysis method using aerial images from drones.