



TEIKYO UNIVERSITY GRADUATE SCHOOLS















Science & Engineering, Doctoral & Master's Degree Programs

2021 Guide book

Division of Integrated Science & Engineering

Division of Informatics Science $\langle Correspondence Course \rangle$

Teikyo University Graduate School of

Science and Engineering

Mission of the Graduate School of Science and Engineering

At the Graduate School of Science and Engineering, advanced research is conducted into a broad range of fields in the natural sciences and technology. The research is done in two ways: through analytic research you can enlarge specialized knowledge in each field, and through synthetic research you will study and research comprehensively beyond the limit of fields. The achievements of the research will contribute to the sustainability of the human race.



Utsunomiya Campus

Utsunomiya Campus is a stunning university precinct featuring a systematically designed layout of faculties and departments set within spacious parklands six times the size of Tokyo Dome. This Campus site is 285,000 m².

Facilities include machine shops, a hangar, the Automobile Technology Center, a plant greenhouse and even an airstrip for flight simulation training. The Campus also provides a complete mobile environment with wireless access in all areas.



Graduate School Building

The Graduate School Building has offices of professors, lecture rooms, the Computer Laboratory, and experimental laboratories for graduate students. Cutting edge researches are conducted in the laboratories: a scanning electron microscope is used to observe metallic materials, non-metallic materials, biological morphology and other phenomena, compressible fluid analysis is conducted using FLUENT software, small-scale rocket engines are under development, followable computing environment for user's behavior, and microalgal biofuels are also under study.

Admission Policy of Graduate School of Science and Engineering

Modern society is such a tangle of complex issues on a global scale that scientists and engineers need to take a broader perspective. Our aim is to advance and integrate each field and contribute to technological development from a more diverse international perspective to nurture the next generation of scientists and engineers who can make ethical judgments.

Applicants are also required to have good achievements in at least two subjects about one of the following fields: mechanical/aeronautic science, electrical and information science, or biology, and to have English proficiency to manage researches and communication.

We welcome applicants with the following abilities and qualities who:

- Have a strong scientific and engineering sense, and are ready for numerous challenges, and also have a sense of curiosity that helps them engage in careful observation.
- 2. Have the ability to engage in active research in the fields of science and engineering.
- Can drive technology forward from an integrated perspective by collaborating with specialists in other fields of science and engineering.
- 4. Have an understanding of current science, technology, and society enough to make ethical judgments as a scientist/engineer, and lead the way towards new research and development with an international perspective.

TEIKYO UNIVERSI

Graduate School of Science and Engineering

Graduate School of Science and Engineering Division of Integrated Science & Engineering Division of Informatics Science Experimental Facilities The Teacher Training Support Program

Division of Integrated Science & Engineering

Open a bright future for humanity through the use of technologies of Materials, Energy, Information and Biology

Period of Study Master's Degree Program : 2 years Doctoral Degree Program : 3 years



Utsunomiya



Dean, Graduate School of Science and Engineering Shohei Sakuda

Attended the University of Tokyo Graduate School of Agriculture Agricultural Chemistry PhD program but left before completion. Worked as an assistant professor in the Faculty of Engineering at Osaka University, and as an associate professor in the Graduate School of Agricultural and Life Sciences at the University of Tokyo. In 2018, moved to the Faculty of Science

and Engineering at Teikyo University, and took his seat as dean of the Graduate School of Science and Engineering. Has served as a board member at the Japan Society for Bioscience, Biotechnology and Agrochemistry, and as vice president of Japanese Society for Chitin and Chitosan, and is current president of Japanese Society of Mycotoxicology (JSM). Won the Sumiki-Umezawa Memorial Award in 2001, and the JSM Award in 2009. Specializes in bioorganic chemistry. Author of a number of books, including *Comprehensive Natural Products II Chemistry and Biology* (as co-author).

Message from the Dean

The Graduate School of Science and Engineering is comprised of two divisions, the Division of Integrated Science & Engineering, and the correspondence-based Division of Informatics Science. The Division of Integrated Science & Engineering teaches students the specialized skills they need in mechanical and systems engineering, space engineering, information and electronic engineering, and bioscience, and gives them the ability to integrate these fields together. Our goal is to foster individuals who can contribute to more creative development in integrated science and engineering. The correspondence-based Division of Informatics Science teaches students about informatics science, which will be the foundation of future technological revolution, and gives them the ability to make their own contributions to the development of information technology. In accordance with the university's founding philosophies of practical learning, international perspectives, and open-mindedness, we work in coordination with communities, research institutes, and industry to make the graduate school an even more vital place of learning. We hope that you will join us in our quest to achieve these goals.

The Division of Integrated Science & Engineering Concept



Cultivating Students

Our philosophy is to utilize materials, energy, information, and biology in improving both human and social welfare in an effective, peaceful, and economically beneficial way, and to develop people who can support further innovation. In addition, we provide a cutting-edge education and conduct advanced researches in the fields of science and engineering that transcends traditional boundaries so that we can give our students a broader perspective and help them participate in the globalized world.

Curriculum Principles

Science and technology are developing at such a rapid pace that we need to respond more flexibly to the development. So the university is actively introducing a number of initiatives to achieve those ends, including the accelerated advancement system (where students skip the 4th year and work on their own research), graduate student teaching assistantships to deepen solidarity with the faculties, and increased acceptance of continuing education and international students.

Research Support System

The expansive campus is surrounded by the bountiful nature of Utsunomiya City. With a view of the distant mountains of Nikko, the campus is the perfect environment for nurturing student creativity. With one of the nation's largest industria I parks, Utsunomiya was designated a "Technopolis" in 1984. Teikyo is actively engaged in national-level industry-academia joint partnerships, and in joint research and development with local industries.

Exam

For information on admission numbers, exam schedule, fees, etc., please refer to the "Entrance Examination Outline" pamphlet.

Division of Integrated Science & Engineering Fields of Research

Mechanical and Precision Systems Related Fields

The aim is to cultivate advanced mechanical engineers by giving them a foundation in strength of materials, thermodynamics, fluid dynamics, and mechanical vibration. We provide instruction and guidance towards research into material strength, structuredynamics, advanced machining, combustion engineering, environmental energy engineering, control engineering and other subjects. Particular emphasis is placed on production-related topics such as computeraided design and manufacture, robotics,



and micro-machining; environment-related topics such as advanced internal combustion engines, and reduction of automobile noise, and safety-related topics such as automobile vibrational and acoustics, analysis, passive safety and high temperature instrument safety and reliability.

Information and Electronic Engineering Related Fields

We provide guidance towards research into computer science, multimedia information engineering and electronic engineering and provide instruction in intelligent systems, multivariate analysis, software engineering, biological signal, recognition informatics, information security, optical information and communication, quantum information and image



science. Particular emphasis is placed on robot systems combined with learning ability and sensor capability, 3D animation technology for numerical simulation and learning support systems by using ICT.

Graduate School of Science & Engineering, Division of Integrated Science & Engineering Core Subject List (2020)

Master's Degree Program

•Division of Integrated Science & Engineering Courses

Advanced Precision Engineering Advanced Systems Engineering Intelligent Systems Multivariate Analysis Environmental Science Technology

•Specialized Courses

Advanced Production, Processing and Machining Method Interdisciplinary Approach to Strength and Fracture of Materials Chemical Reaction Engineering Robot Engineering Technology of Environment & Energy Aerodynamics Combustion General Thermodynamics Computer and Visualization Methods for ice and Engineering Helicopter Engineering Aerospace Propulsion Rocket Engineering Strength of Material and Structure Advanced Control Engineering Unmanned Aircraft Engineering Lecture on Biological Signal Environmental Systems Computational Fluid Engineering Optical Information and Communication Engineering Recognition Informatics Advanced Software Engineering Quantum Systems Engineering Applied Web System Information Security Quantum Information Science Breeding Science

Bioactive Molecules

- Cell Biological Science and Engineering Brain and Neuroscience Microorganism Utilization Food Analysis Structural Analysis of Biomolecules Environmental Physiology of Plants Plant Immunology
- Microbial Chemistry
- Regulation of Plant Growth and Development Developmental Morphogenesis

Research Courses

- Colloquium I on Advanced Science and Engineering
- Colloquium II on Advanced Science and Engineering
- Colloquium III on Advanced Science and Engineering
- Special Laboratory Work I on Advanced Science and Engineering
- Special Laboratory Work II on Advanced Science and Engineering

Doctoral Degree Program

Advanced Topics on Mechanical and Precision System Advanced Topics on Aerospace Engineering Advanced Topics on Information and Electronic Engineering Advanced Topics on Biosciences Special Laboratory Work I on Advanced Science and Engineering Special Laboratory Work II on Advanced Science and Engineering Colloquium I on Advanced Science and Engineering Colloquium II on Advanced Science and Engineering

Aerospace Engineering Related Fields

Aerospace engineering is comprehensive engineering mainly based on aerodynamics, flight dynamics, control mechanics, structural mechancs, propulsion engineering, system, engineering, material science and so on.

We will give lectures and research guidance for the students to



acquire scientific and technical skills by which they can improve the performance of the aircraft, artificial satellites and rockets, secure the safety, and support the complex system used in extreme conditions. In research, we focus on practical studies and work on practical tasks using space chambers and unmanned aerial vehicles.

Bioscience Related Fields

We offer education and research into the clarification and application of vital phenomena in animals, plants, and micro-organisms through molecular biology, molecular genetics, organic chemistry, biochemistry, cellular biology, plant physiology, and food science. We utilize



cutting edge NMR , LC-MS/MS, imaging MS, electron microscopes, fluorescence microscopes and other advanced analytical equipment.

Titles of the Previous Doctoral and Master's Thesises (Examples)

Mechanical and Precision Systems Related Fields

- Study for Effect of Combination of After-treatment systems on Nano-particles exhausted from Diesel Engine
- 2D Study for Running of Rimless Wheel
- Study for the Effect of BDF (Bio-Diesel Fuels) on Formation of Particles and Exhaust Emissions of Diesel Engine
- Research on Diesel Engine Combustion Simulation Using Biodiesel Fuel by Free Spray Injection Measurement

Aerospace Engineering Related Fields

- Evaluation Study of The Effect of Wing Surface Characteristics on Aerodynamic Characteristics of Martian Atmosphere Inrush with flexible structure
- Investigation of single element combustion fluid phenomenon of liquid rocket engine
- Study on fiber/matrix interface of SiC/TiAl composite materials
- Study on Aerodynamic Characteristics of Two-dimensional Wing with Plasma Actuator

Information and Electronic Engineering Related Fields

- A Framework for Object Detection using Deep Learning
 Development of non-invasive physiological measurement during game
- playing and its applicationDevelopment of auto-sampling machine for sanitary pest and
- surveillance • Attended Auxiliary Supervision Mechanism for Face Anti-spoofing

Bioscience Related Fields

- Visualization of metabolites in strawberry (Fragaria×ananassa) by imaging mass spectrometry.
- Photo-regulation of carotenoid synthesis in *Euglena gracilis*
- Spatio-temporal analysis of gene expression and endogenous
 phytohormone during tissue-reunion process of incised plant tissue
- Behavior and gene expression analysis with mouse model of autism spectrum disorder

Future

Our graduate school provides curriculum with practical application to the real world. Students will have the potential to work in research sections at public bodies, companies, and other institutions.

Supervisor

Division of Integrated Science & Engineering

Mechanical and Precision Systems Related Fields

Master's Degree Program Course Subjects

Advanced Precision Engineering Advanced Production, Processing and Machining Method Interdisciplinary Approach to Strength and Fracture of Materials Chemical Reaction Engineering Robot Engineering Technology of Environment & Energy Aerodynamics General Thermodynamics

Master's Degree Program Professors

Professor	Takeshi Isogai (Strength of Materials) **
Research Theme	Evaluating fatigue crack growth under multiaxial stress and researching life prediction, researching strength evaluation techniques for high temperature materials
Professor	Hideaki Inoue (Vehicle dynamics) **
Research Theme	Research for Automated Vehicle and Advanced Driver Assist Systems / Driving behavior
Professor	Toshihisa Ueda (Fluid dynamics, Combustion Science) *
Research Theme	Methane hydrate combustion, flame stability of boiler combustion, Chaotic motion in reactive flows
Professor	Akira Kato (Advanced Power-plant Research for Automobile) **
Research Theme	Research for automobile PP(ICE and Hybrid) on reducing harmful exhaust emissions, and improvement of fuel economy using engine measurement, real driving or CAE
Professor	Sadatoshi Koroyasu (Foundry Engineering) **
Research Theme	Research into lost foam casting process, mold filling, and solidification analysis
Professor	Akihiko Shinotake (Combustion/Heat Transfer Engineering) **
Research Theme	Research of energy source, consumption, emission flow, and increasing efficiency of energy use in industrial field
Professor	A. Toshimitsu Yokobori, Jr (Time dependent fracture and strength of materials) *
Research Theme	 Research on the strength of structural materials for jet engine and high efficiency electric power plant Numerical analysis of hydrogen diffusion and testing of hydrogen embrittlement for utilization technology of hydrogen energy Establishment of noninvasive diagnostic theory and its equipment of blood vessel disease based on science of complexity including AI technology
Associate Professor	Akio Aoki (Quality Engineering - Automotive) **
Research Theme	Research into motors and fuel cells inhydrogen-fuel- cell-kart, installed-battery drive train optimization
 Associate Professor 	Yoshito Ikemata (Robotics) **
Research Theme	Development of walking robots based on principles of passive walking / analysis of human walking mechanisms
 Associate Professor 	Yoshio Kurosawa (Vibration and Acoustics Engineering) **
Research Theme	Sound absorption and insulation analysis for laminated porous materials using transfer matrix method, Damped vibration and acoustic analysis for strings using finite element method.
Associate Professor	Hiroshi Hino (Metal Material Processing) **
Research Theme	Bending processing of cell structures, precision processing of brittle materials
 Senior Assistant Professor 	Takenori Ohno (Machining) **
Research Theme	The micro free form cutting on brittle materials; The micro vibration cutting on bio-compatible materials
 Senior Assistant Professor 	Masashi Makita (Mechanic) **
Research Theme	1. Study of Analysis and Mitigation of Vehicle Crash Performance 2. Study of Mitigation of Vehicle Occupant Fatigue

Doctoral Program Professors

Supervisor of ** attachment above-mentioned

Aerospace Engineering Related Fields

Master's Degree Program Course Subjects

Advanced Systems Engineering Combustion Computer and Visualization Method for Science and Engineering Helicopter Engineering Aerospace Propulsion Rocket Engineering Strength of Material and Structure Advanced Control Engineering Unmanned Aircraft Engineering

Master's Degree Program Professors

Professor	Michio Imai (Aviation) **
Research Theme	Aviation accident mechanisms and human factors, helicopter accident avoidance
Professor	Yasuhiro Koshioka (Aerodynamics) **
Research Theme	Research into the aerodynamic shape design of aircrafts and related aerodynamic devices
I Professor	Keizo Hashimoto (Materials Science) **
Research Theme	Research into the lightweight, heat-resistant, intermetallic compound TiAl, research into nickel- base super-alloy turbine blade texture change
Professor	Takashi Hiramoto (Helicopter Engineering) **
Research Theme	Research into helicopter mechanisms and flight principles, research into the influence of design, operation, environment, etc. on aircraft flying safety
Professor	Hiroyasu Manako (Rocket Systems Engineering) **
Research Theme	Liquid-propellant rocket engines and rocket systems
Professor	Naoharu Yoshitani (Control Engineering) **
Research Theme	Aircraft flight control technologies research, small unmanned vehicle design, fabrication, and flight control
Professor	Hiroshi Yoneda (Flight Dynamics and Control) **
Research Theme	Research into unmanned aircraft systems, electric- powered aircraft and optionally piloted vehicles (OPV)
Associate Professor	Masaaki Kawamura (Gas Dynamics) **
Research Theme	Research into fluid phenomena around aircraft and spacecraft bodies, solar system planetary exploration
Associate Professor	Satoshi Yamada (Thin Film Materials Engineering) **
Research Theme	Fabrication of optical response TiO2 thin film photocatalysts using high-frequency magnetron sputtering devices
Senior Assistant Professor	Yoshihiro Tsuruda (Space System Engineering)
Research Theme	Spacecraft system design, operation, electrical/ telecommunication subsystem components, deployment system, solar cell, battery, ground station, Nano/Pico-class satellite
Senior Assistant Professor	Masaki Nakamiya (Astrodynamics)

Supervisor of * attachment above-mentioned

Information and Electronic Engineering

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Intelligent	Systems
Multivaria	te Analysis
Lecture or	Biological Signal
Environm	ental Systems
Computat	ional Elvid Engineering
Computat	formation and Communication Environment
Recognitio	on Informatics
Advanced	Software Engineering
	Master's Degree Program
	Master's Degree Hogian
Professor	Masayuki Arai (Recognition Informatics) **
 Research Theme 	Computer Vision, Natural Language Processing, Information Visualization
Professor	Shigeru Sasaki (Computational Dynamics) **
Research Theme	Research into lava flow simulation using cellular automata methods, and continuum simulation using particle methods
Professor	Tetsufumi Tanamoto (Quantum Information Science) **
Research Theme	Condensed mattor theory and semi conductor device simulation for quantum information processing
Professor	Yuichi Hasuda (Robotics) **
Research Theme	Disaster reduction system linked with earthquake warning / Pesticide spraying robot / Mechatronics / Auto sampling machine for sanitary pests / Technical education
Professor	Hiroyoshi Watanabe (Information and Systems in Education) **
Research Theme	Integration of collaborative and individual learning in ICT class design and learning support systems
Professor	Ryuji Watanabe (Computational Materials Science) **
Research Theme	Research into metal strength, grain boundary structures, and grain boundary energy using molecular dynamics methods
Associate Professor	Mitsuhiro Ogawa (Biomedical Engineering) **
Research Theme	Biomedical engineering, Nursing science and engineering / Non-invasive biomedical instrumentation and biosignal interpretation / Game science including Serious game (Applied game) and Gamification
Associate Professor	Norihiro Kamide (Logic in Computer Science) **
Research Theme	Foundations of knowledge representation and reasoning systems, non-classical logics and their applications to computer science
Associate Professor	Yasuyuki Kobayashi (Prognostics) **
Research Theme	Basic and applied research for statistical machine learning and development research of prognostics for photovoltaic systems
Associate Professor	Naoki Kondo (Optical Information Science) **
Research Theme	Development of imaging devices using optical nano- technologies / Computer simulation of optical properties of nano-materials
	Doctoral Program

Supervisor of % attachment above-mentioned

*Potential students must receive approval from their desired advisor when applying. Please be sure to get preliminary confirmation.

Related Fields

Course Subjects

Quantum Systems Engineering Applied Web System Information Security Quantum Information Science Computational Materials Science for Photonics

Professors

Associate	Shinichi Nakamura
Professor	(Condensed Matter Physics - experimental) **
Research Theme	Magnetism and electrical conductivity in strongly- correlated oxides, electrodynamics and magnetodynamics in polar oxide magnetic bodies
Associate	Fumihito Furukawa
Professor	(Information Engineering) **
Research Theme	Research into high-performance computing systems, research into teaching and learning methods using information communications technology
 Associate	Koichi Muro
Professor	(Optoelectoronics) **
Research Theme	Research into optical coatings and measurement system. Development of measurement system using optical fiber
Associate	Takuo Mori
Professor	(Information Security) **
Research Theme	Software copyright protection, safe mobile agent systems and their application
 Senior Assistant	Takeaki Shionome
Professor	(Assistive & Accessible Computing)
Research Theme	Development of the Organization Simulator for Prevent Workplace Depression, Speech-to-Text Interpretation Service via Crowdsourcing
Senior Assistant	Shinnosuke Nishiki
Professor	(Numerical Simulation of Thermal Fluid)
Research Theme	Numerical Simulation of Fire and / or Satety using FDS (Fire Dynamics Simulator)/ DNS of Turbulent Premixed Flames
Senior Assistant	Mieko Masaka
Professor	(Social Systems Engineering)
Research Theme	Theresolution of public issues by behavior modification stage approach/Life log method using the mobile phone etc.
Senior Assistant	Kozo Mizutani
Professor	(Information Systems) **
Research Theme	Research into the followable computing environment to user's behaviour and the methods of web based system development
 Senior Assistant	Ken Yamane
Professor	(Intelligent Information Processing)
Research Theme	Research into soft computing, brain-like information processing and human support technology

Bioscience Related Fields

- Environmental Science Technology Breeding Science Bioactive Molecules Cell Biological Science and Engineering Brain and Neuroscience Microorganism Utilization Food Analysis
- Structural Analysis of Biomolecules Environmental Physiology of Plants Plant Immunology Microbial Chemistry Regulation of Plant Growth and Development Developmental Morphogenesis

Master's Degree Program Professors

Master's Degree Program Course Subjects

Professor	Kenichi Uchida (Bioorganic Chemistry) **		Associate Professor	
Research Theme	Synthetic study of natural products, and structural determination of organic compounds using NMR		Research Theme	F
Professor	Shigeo Uchino (Neurobiology, Neuropathology) **		Associate Professor	Y (1
Research Theme	Clarifying the molecular basis of neuronal develop- ment, clarifying the neuropathology of developmental diseases		Research Theme	R
Professor	Masayuki Kajitani (Genetic Engineering) **		Associate Professor	Г (1
Research Theme	Structure and function of host factor HF-I for RNA phage growth. Development of Teaching Materials in Science Education.		Research Theme	T ca n
Professor	Jinichiro Koga (Food Science) **		Senior Assistant Professor	F (I
Research Theme	Research on functions of sphingolipids in plants and animals		Research Theme	S g
Professor	Shohei Sakuda (Bioorganic Chemistry/Environmental Natural Products Science) **		Senior Assistant Professor	K (I
Research Theme	Chemistry and chemical biology of bioactive substances such as microbial signal molecules, anti-asthmatic agents, and mycotoxin production inhibitors		Research Theme	R d ti
Professor	Tomoko Shinomura (Plant Physiology) **			
Research Theme	Plant photomorphogenesis, photoenvironment response mechanisms, and evolutionary biology research, search and analysis for microalgae usable in bioenergy production			
Professor	Senji Takahashi (Natural Product Organic Chemistry) **			
Research Theme	Separation of microorganisms (actinomycetes, bacteria, fungi) from peculiar soil environments and specific plant types, and the search for new biologically active substances			
Professor	Naohisa Yanagihara (Polymer Science) **			
Research Theme	Plastic chemical recycling using supercritical fluids, generating fundamental chemical resources			
Associate Professor	Masashi Asahina (Plant Physiology/Molecular Biology) ※			
Research Theme	Research for plant environmental response and phy tohormone biosynthesis/mechanism of plant tissue- reunion process and phytohormone functions			
	Doctoral Pro	gram	Professor	s

Supervisor of $\$ attachment above-mentioned

Associate Professor Hirofumi Enomoto (Biomolecular an Research Theme Function analysis of biomolecules in animals and plants using mass spectrometry. Associate Professor Yuko Takayama (Microbiology) ** Research for the molecular basis of chromosome architecture and transcriptional gene expression Research Theme Associate Professor Takae Hirasawa The abnormality of brain function and development caused by stress and environmental factors, and the mechanism of brain plasticity by epigenetic regulation Research Theme Senior Assistant Ryoma Ota Professor (Reproductive Biology, Developmental Genetics) Research Sex determination and quality control in animal germline cells Senior Assistant Professor (Plant Biotechnology) ** Research for functions of plant hormones in plant disease resistance / Functional analysis of stress-related transcription factors in plant Research Theme

Professors

Division of Informatics Science Correspondence Course (Master's Degree Programs)

The Division of Informatics Science - for residents in Japan who work full time and study advanced technology at home



Master's Degree Program : 2 years

Division of Informatics Science

Supervisor "You must make contact with the supervisor of your choice to obtain.

Master's Degree Program Professors

Professors Masayuki Arai (Recognition Informatics) Shigeru Sasaki (Computational Dynamics) Tetsufumi Tanamoto (Quantum Information Science) Yuichi Hasuda (Robotics) Naoharu Yoshitani (Control Engineering) Hiroyoshi Watanabe (Information and Systems in Education) Ryuji Watanabe (Computational Materials Science)

Associate Professors

Mitsuhiro Ogawa (Biomedical Engineering) Norihiro Kamide (Logic in Computer Science) Yasuyuki Kobayashi (Prognostics) Naoki Kondo (Optical Information Science) Fumihito Furukawa (Information Engineering) Koichi Muro (Optoelectoronics) Takuo Mori (Information Security)

Senior Assistant Professors

Takeaki Shionome (Assistive & Accesible Computing) Shinnosuke Nishiki (Numerical Simulation of Thermal Fluid) Mieko Masaka (Social systems Engineering) Kozo Mizutani (Information Systems) Ken Yamane (Intelligent Information Processing)

Cultivating Students

Teikyo University now has a graduate degree course through correspondence learning for those who have full-time jobs or those who want to study at home. The Graduate School of Science and Engineering Division of Informatics Science Correspondence Program was established to provide adult learners with advanced knowledge and skills in informatics science through the Internet. Its aim is to cultivate highly specialized professionals and to promote higher education in informatics science.

Curriculum Principles

The correspondence curriculum consists of Informatics Science Specialized Courses, Special Seminar, and Special Laboratory Work, with the latter two being compulsory. Informatics Science Specialized Courses are conducted through self-study using specified text, with email guidance and discussion with your professor of the course in charge. Special Seminars are practical learning courses through which students acquire practical and specialized knowledge while they conduct research into their master's thesis. Students acquire highly specialized knowledge by staying in close contact with the university through use of on-campus seminars and web-based discussion on the Internet, based in the guidance of the advising professor. In Special Laboratory Work, students choose a specialized research theme in informatics science with the guidance of their supervisor, and pursue a research challenge. A mid-term report/debriefing is conducted to determine the progress of the student's research. According to the results of the reports, your supervisor may give you alternative suggestion.

Curricular Principles for Master's Program



Special Seminar [Compulsory]

Specialized Courses [Elective]

Research Support System

The correspondence students can use the library service on Utsunomiya Campus. Through the library website, the students can search the collections of libraries at other Teikyo University campuses as well. In addition, students can visit other campus libraries and obtain literature from Utsunomiya's library through the mutual loan copy service. When on campus, students can receive educational and research guidance in the IT Laboratory and the Multimedia Laboratory.

Entrance Examination Info

For all the information including admission quota, exam schedule, and fees, please make inquiries to the *Tsushin Kyoiku* section to the "Entrance Examination Outline" pamphlet.

From Application to Completion



Graduate School of Science and Engineering -Information Science Primary Course List (2020)

Recognition Informatics

Engineering of Knowledge Information Processing Introduction to Modern Cryptography and Information Security Computational Science Environmental Information Science Control Engineering with Information Technology Quantum Information Science Wireless Information and Communication Engineering 3-Dimensional Image Science Introduction to Biosignal

Object-Oriented Design Statistical Machine Learning Applied Web System Multivariate Analysis Parallel computing

Intelligent Systems

- Colloquium I on Advanced Science and Engineering

Advanced Software Engineering

Colloquium II on Advanced Science and Engineering Special Laboratory Work I on Advanced Science and Engineering Special Laboratory Work II on Advanced Science and Engineering

Titles of the Previous Master's Thesises (Examples)

- Wireless data transmission from health care equipment using Zig Bee communication system
- Instructional Design of a Class Using Learning Management System in High School Quasi-Interaction Simulation of Fluid-Structure by MPS Method and Finite
- Flement Method
- Pass-Fail Prediction of National Examination for the Radiological Technologist using Mock Examinations
- Development of a High Resolution 4D Light Field Camera Simulator and Light Field Reconstruction Programs
- Course Design and Evaluation of Unit on Problem-Solving in Subject"Information"Introducing Self-Assessment of Student
- Analysis of Tensile Deformation of Symmetric Tilt Grain Boundry in Iron by Atomic Level Simulation

- Using Machine Learning to detect seizures in epilepsy EEG datasets
- Development of Pacemaker Heart Sound Acquisition System and Its Analysis Method for Home Use - Attempt of Implementation on Arduino and Analysis using Scilab -
- Study of new analytical methods for estimating patients of depression / anxiety disorder
- A Study for Efficient Method of Quiz Input for LMS for Clinical Engineer National Exam Preparation
- A study on role estimation in Werewolf game using selective desensitization neural networks
- Verification of Clinical and Medical Reasoning and Outology by Extended Model Checking

Experimental Facilities

Teikyo University is a great university where you can conduct novel experiments, so that you will surely enjoy researching advanced technology.

Mechanical and **Precision Systems Related Fields**





Machining Center This machine tool has an automatic

tool changer, controls 3 axes simulta neously, and performs metalworking of a complicated solid.



3D Printer This 3D Printer is an active molding machine by laminating the resin using the 3D laminated data



Car Sim

This simulator reproduces real car movement



Ultradepth Microscope

This microscope uses a laser to detect irregularities on large sample surfaces invisible to normal microscopes, and display those irregularities in 3D.



High Temperature Multiaxial Fatigue Testing Machine This machine is used to test high temperature materials by repeatedly applying multiple loads to evaluate of



3L Turbocharged and Inter- 3D Scanner cooled Diesel Engine This engine helps drive research into

the combustion of various fuels, and into the low exhaust emissions, low CO_2 and low fuel consumption engine.



4-wheel Chassis Dynamometer

The 4-wheel chassis dynamometer can be used to measure the amount of engine exhaust gas produced while driving and the specific fuel consumption. Also, by reproducing actual on-road driving conditions, it is used for the measurement driving



3D CAD (CATIA™ ver.5,50Li.) This 3D CAD system makes it possible to shorten the time it takes to fabricate molds, a process that has always been timeco nsuming and complex.



This machine is the 3D-digitazer for This piece of equipment is an measuring the solid shape data. The instrument used to make non-contact scanning data is obtained as a STL vibration measurements of a surface. data.



This equipment is used to calibrate vehicle axles to the correct angle.



CNC Precision Surface Grinding Machine The curved surface and highly precise plane grind are the most advanced highperformance machine which can be done.



Laser Doppler Vibrometer

Information and Electronic **Engineering Related** Fields



IT Laboratory The IT Lab is open for students to do class tasks, and they can work on their graduation research. (NOTES: The



Create 3D computer graphics using Shade⁶



The Server Group provides a variety of

software for use in practical learning of

Server Group

information systems

3D Image Processing System 3D Scanning System This system can be used to obtain 3D data of streetscapes and other outdoor



Matlah® This software is used to model control, communication, optical, and other systems



Electronics Laboratory Here, students learn how to design and fabricate electronic circuits, and gain experience in controlling electronic devices



Signal Intensity Measurement System The meter converts analog signals into digital and simultaneously collects a variety of data.



Line-tracing Robot Control a robot by writing programs to install on its internal microcomputer.



Prototyping System The system, including a PCB milling machine and a through-hole plating line, allows electronic PCB prototyping by graduate students themselves.



Practical System - Installed **Electronic Circuits**

Learn about FPGA, CPLD, one-chip microcomputers, and other elements installed in devices



Motion Capture System This system measures and captures 3D human movement.





QR Code Authentication System Manage complicated passwords.

Aerospace **Engineering Related** Fields





T-2 Supersonic Advanced **Training Aircraft**

The first supersonic aircraft developed in Japan. The aircraft provides students with real experience with the basic principles of flight.



Sophia Micro Gas Turbine (Jet Engine) Test Cell

A J-850 gas turbine is installed within a large-scale test cell. It allows for real time measurement of jet turbine operating conditions.



Model Airfield

Airfield used mainly for flight experiment of UAV. It is located on the campus and has the flight airspace of 250 m × 130 m and the runway of 70 m × 60 m.



Space Chamber

Test facility that reproduces the space environment that is high temperature and low temperature in a vacuum state not on the earth. It is used for the research and development of small satellite size space equipment.



Small Satellite Radio Tracking Antenna

This antenna is installed on top of the Department of Aerospace Engineering building. It is used to capture the signals sent from orbiting artificial satellites including TeikyoSat.



Testing Facility

This installation is used to test combustion in hybrid rockets, which have the benefits of being high safety and low cost, high performance, and low polluting.



Clinostat

Equipment for simulating a micrograv-ity environment by dispersing the direction of gravity by continuously rotating two orthogonal axes



Flight Trainer US-built Robinson R22 helicopters.

The R22 is used as a trainer for the future pilots in many schools around the world.



(CATIA™ ver.5,50Li.)

The computers with the CATIA 3D-CAD software is available to every student. The software allows for both diagram plotting and strength calculation.



Scanning Electron Microscope

With this microscope, a thin electron beam is used to scan a sample, and the coordinate information fromowhere the beam hits is used to construct and display an image. One type of electron microscope.



Eiffel-type Wind Tunnel This wind tunnel is used to evaluate lift and drug forces caused by the air flow

around airfoils and airborn objects.



ANSYS® Fluent Computational Fluid Dynamics Software This fluid simulation software is highly reliable and often applied in a bi range of simulations.

Bioscience Related Fields





This greenhouse is used for research on plant growth and development,

DNA Sequencer

LC-MS/MS

This device is used to analyze the DNA base sequence (the alignment of A, C, G, T). RNA base sequence is analyzed through transcribing RNA into DNA.

Through a combination of high perfor-mance liquid chromatography (LC) and tandem mass spectrometry (MS/MS), this device can be used for the identifi-cation and quantification of ultratrace constituents. It is used in a broad range of research fields, from natural product chemistry to environmental, medical, and food sciences.



Mouse Breeding Rack Keep the breeding environment of the mouse, including temperature, humidity, and lighting constant, and breed the genetically modified mice used for



Real-time PCR Quantitative reverse transcription PCR system for gene expression analysis.



Confocal Laser Microscope was used to obtain the high-magnification and resolu-tion optical image with depth selectivity, and widely used in biological science including cell biology, microbiology, neuroscience and plant biology.



Mass spectrography is conducted directly Laser Microdissection is used to isolate on tissue sections, and this device can create an biomolecular image based on the information obtained.



NMR (Nuclear Magnetic **Resonance Spectrometer)**

The NMR spectrometer is used to obtain the signals from nuclie of atoms which construct various substances. Analyzing the NMR spectrum, it can be elucidated the structure and dynamics of the molecules including proteins and nucleic acds.



The fermentor is used to produce the active constituents of microorganisms in large amounts. By maintaining culture conditions, stable microbe growth can be achieved.



specific microscopic regions from FFPE and frozen sections from tissue samples with laser.



Electrophysiological Equipment

This machine is used to analysis of neuronal function by patch-clamp method. We makes brain slices of mouse and measure membrane potential of a neuron by glass electrode.

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Our tuition fees are now equivalent to those at national universities. For details, visit our website or read the "Entrance Examination Outline" pamphlet.

Teacher Training

Junior or senior high school teachers with a first class certificate in science and senior high school teachers with a first class certificate in industry hoping to acquire specialized certification can take the necessary courses through the Master's Degree Program. The program can provide specialized junior/senior high school teacher certificates in science and specialized senior high school teacher certificates in industry.

Application Documents Contact

Information Requests

Teikyo University Information Request Center



Hours: 9AM - 10PM (Open weekends, holidays, and New Year.)



The university website can be accessed on mobile phone. (Information requests can also be made from the site.)

Utsunomiya Campus

For scholarship and entrance exam Inquiries, call: +81-(0)28-627-7123 (Student Support Group, Student Support Team) For class information, call: +81-(0)28-627-7120 (Student Support Group, Kyomu-Team)

FAX:+81-(0)28-627-7219 E-mail:gakusei@riko.teikyo-u.ac.jp

Scholarships

1) Okinaga Scholarship Grants

The scholarship will be given to those students in the Division of Integrated Science & Engineering who are of academic distinction and with exceptional financial need. The grant amounts to 40% of the cost of classes and facilities fees for two years of study. Eligibility criteria are below.

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- 1) University GPA of 3.0 (out of a possible 4.0.)
- 2) Excellent results on the entrance exam.
- 3) The annual income of the tuition payer should be less than the given amount.

You should apply during the university application period. In principle, you cannot apply for this scholarship after your matriculation. The application forms are available from the Utsunomiya Campus Student Support Team. Successful applicants will be notified after the screening process is complete.

 Local Government and Private Scholarships (Grants and Loans) Eligible graduate students will be contacted through the university message board.

(Correspondence Course) Division of Informatics Science

For entrance exam and class information Inquiries, call : +81-(0)28-627-7117 (Student Support Group, Kyomu-Team) FAX : +81-(0)28-627-7219 E-mail : tsushin@riko.teikyo-u.ac.jp



Teikyo University Graduate School of Science and Engineering

Personal Information Policy

Personal information obtained by the university is managed based upon the Teikyo University Personal Information Usage and Handling policy, and is only used for the university entrance procedures and for your information regarding entrance exams. For details, please visit our website at http://www.teikyo-u.ac.jp/