University of Tsukuba

Support for Students

Financial support

The Graduate School of Systems and Information Engineering offers exemption of the entire or half of tuition and other fees to Master's program students who fulfill certain conditions. Furthermore, financial assistance such as tuition waivers, employment as research assistants (RAs) or teaching assistants (TAs), etc., is offered to generally all the students entering the Doctoral Program. For more information, please see the home page of the Graduate School of Systems and Information Engineering at http://www.sie.tsukuba.ac.jp.

www.risk.tsukuba.ac.jp/**scholar_eng.html**

Commendation system

Students who have shown exceptional results in their studies, etc., may receive commendation in the form of the President's Award, the Provost's Award, or other form or recognition.

In addition, the Department of Risk Engineering also presents its own awards. The Chairman's Award is divided into research and educational categories, and each year at least one student in each division receives an award.

Support for Working Members of Society (Non-Traditional Students)

www.risk.tsukuba.ac.jp/**workings_eng.html**

Accelerated doctoral program for working member of society

The Accelerated Doctoral Program for Working Members of Society ("Accelerated Program") is designed for employed people who have demonstrated a certain level of research result, ability, etc., in their field. In this program, students can receive a PhD in only one year instead of the standard 3-year doctoral program. For more information, please see the brochure for this program or the home page of the Graduate School of Systems and Information Engineering.

Daytime/nighttime class program for doctoral students

In this program, students can continue working at their jobs as they take daytime or nighttime classes at the Tokyo campus (Otsuka, Bunkyo-ku). It was launched in the 2009 academic year to promote the development and expansion of graduate school education for working members of society. In some fields, students can receive instruction through a cooperative relationship with the Research Organization of Information and Systems of the Institute of Statistical Mathematics. Qualified applicants are people who meet the requirements for non-traditional students of Doctoral Program in the Graduate School of Systems and Information Engineering.

Open Campus

www.risk.tsukuba.ac.jp/**open_campus_eng.html**

The Department has an open campus every spring and autumn.
For details, please check the home page of the Department.

Access and Contact Information

www.risk.tsukuba.ac.jp/**access_eng.html**

Tsukuba Express -> Bus that stops at Tsukuba Station
Take either the bus bound for "Tsukuba Daigaku Chuo" or "Tsukuba Daigaku Junkan Bus" ("Migi-mawari") (University Loop-line On-campus Bus) and get off at "Dai-ichi (No. 1) Area Mae."
1-1-1 Tennodai, Tsukuba, Ibaraki 305-8573
7th, 8th and 12th floors of Laboratory of Advanced Research B, University of Tsukuba
Phone: +81-29-853-5752 (Chair's Office of the Department of Risk Engineering)
Facsimile: +81-29-853-5809 (Office of the Department of Risk Engineering)
E-mail: entexam@risk.tsukuba.ac.jp (Chair of the Department of Risk Engineering)
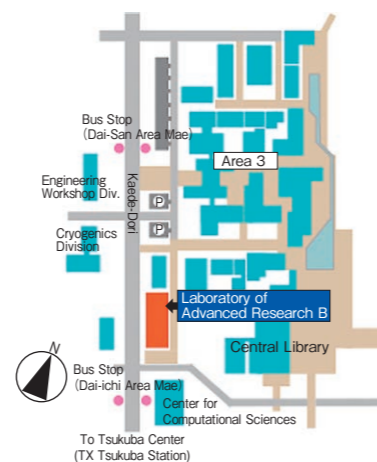
Tokyo Campus (Bukyo School Building)
3-29-1 Otsuka, Bunkyo City, Tokyo 112-0012

http://www.risk.tsukuba.ac.jp/

University of Tsukuba

Graduate School of Systems and Information Engineering, University of Tsukuba

Department of Risk Engineering

An Academic Medicine for Society's Risks

Risk⋯ When you hear that word, what sort of impression do you get?

There are many possible threats or undesirable circumstances for society. For example, there is the danger of large-scale urban disasters and traffic accidents, influenza and environmental problems, and leakage of personal information from the Internet. Today's society is fraught with latent dangers.

However, it is possible to estimate risk and understand it quantitatively to control and ameliorate it. We in academia are charged with reading the health of society, identifying symptoms of illness, and creating "medicine" that will treat and prevent them. Doctors and hospitals are supposed to look after our health. Risk research helps to make society safer and more wholesome.

The Risk Engineering Department of the Graduate School of Systems Information Engineering, the University of Tsukuba opens its doors wide to graduates, working members of society and foreign students in an effort to encourage cutting-edge research in advanced science and technology and to nurture highly trained workers who will be able to contribute to society through their study of the world of risk. In addition, the results of theoretical and applied research are applied to a research education system that can help to make society safer and more secure. The Department also strives to continuously produce young researchers who can provide leadership for creating cutting-edge science and technology and who can take charge of risk engineering research with a global perspective.

Against a backdrop of the occurrence of risk in today's society and the various multi-faceted problems it entails, majors in risk engineering are engaged in education and research, with special focus on the four fields to the right.

Total Risk Management
This field is concerned with learning about mathematical and information methods that are necessary for discovering, predicting and evaluating risk.

Cyber Risk
In this field, research is being conducted on this new type of risk that has been rapidly expanding with the popularization of the Internet.

Urban Risk
This field addresses the management and policies for dealing with urban types of risks such as earthquakes, floods, traffic accidents and crime.

Environmental and Energy System Risk
This field deals with enormous technical risks such as energy technology, with consideration for the sustainability of society and the world.

For
Total Risk Management

For
Cyber Risk

For
Urban Risk

For
Environmental and Energy System Risk

http://www.risk.tsukuba.ac.jp/

Education

Educational objectives

As the information networks and enormous systems that surround us expand, the risks and associated effects that occur with their incompleteness also expand. The Risk Engineering Department seeks to nurture researchers who possess the high level of skills needed to resolve such risks with scientific and engineering approaches, and to educate people who can play an active role in society.

In other words, our objectives are to nurture people who can manifest the ability to manage projects and examine and develop concrete means for resolving these problems by learning about the basic theory, technologies for processing related information, etc., for analyzing and evaluating risk while simultaneously having a wealth of knowledge and interest about actual problems related to risk who will provide strong leadership and a wide range of perspectives for addressing these problems, and understanding the series of processes from setting a problem statement to finding resolutions through engineering methods.

With these educational objectives, we provide academic guidance that can help students achieve the following goals:

Degrees that can be acquired

Master of Engineering, Master of Science in Policy and Planning Sciences
Doctor of Philosophy in Engineering, Doctor of Philosophy in Policy and Planning Sciences

Practical risk analysis in group research

In group seminar in risk engineering, first-year students conduct research in groups. An advisory professor is appointed to each group to provide students with guidance in everything from proceeding with their research, to writing reports, and making presentations. Some of the results are presented at symposia and other academic venues outside of the university.

Projects

About once every month, instructors and students in the department meet to discuss research in Risk Engineering with invited researchers or practitioners at Risk Engineering Research Meeting (RERM). In addition, the Department's bulletin "Risk Engineering" is published once a year, and ten textbooks in the Risk Engineering Series (Corona Publishing Co.,Ltd.) have been issued in succession.

List of Classes

Total Risk Management

Introduction to Soft Computing I, II	Seminar in Soft Computing	Theory of Stochastic Systems and Its Applications
Data Mining	Reliability and Safety of Large-Complex Systems	Cognitive Risk Analysis
Integration of Information with Diversity	Financial Risk Analysis	Mathematics of Derivative Theory
Investment Science	Visual Information Systems	

Cyber Risk

Advanced Course in Authentication Systems	Introduction to Modern Information Processing and Communication Network	Advanced Modern Information Processing and Communication Network
Advanced Course in Network Security I, II	Advanced Course in Cyber Risk	Advanced Course on Information Security
Electronic Commerce		

Urban Risk

Urban Risk Management	Risk in Urban Systems	Urban Structural Systems
Urban Risk Communication	Urban and Regional Analysis	Seminar in Urban Risk Analysis

Environmental and Energy System Risk

Risk Assessment on Energy Systems	Lecture on Advanced Energy Theory	Advanced Course in Energy Science
Seminar in Risk Analysis and Assessment on Energy Systems	Risk in Process Systems	Advanced Reliability Engineering
Advanced Course on Mathematical Model Analysis		

Staff and Research Areas

Total Risk Management

Itoh Makoto — Systems safety: mutual trust and cooperation in human-machine systems, cognition, inference, and decision making under uncertainty or gray zone, perception and acceptance of risk.

Inagaki Toshiyuki — Human machine symbiosis: design of human interaction with smart machines, adaptive automation, risk perception, reliability and safety of human-machine systems, reasoning and decision making with incomplete information.

Sato-Ilic Mika — Multi-dimensional data analysis, statistics: clustering based on latent structure models for similarity data, fuzzy clustering, and multi-way data theory.

Endo Yasunori — Development of methods to analyze risk of uncertain systems: fuzzy theory and its applications, pattern classification, and modeling of uncertain systems using fuzzy mapping and risk analysis based on the models by methodology of functional analysis.

Kameyama Keisuke — Pattern recognition, learning theory, and signal/image processing.

Kurahashi Setsuya — Social simulation, Evolutionary computing, Agent technology, Data mining, Skill extraction support system, Recommender system.

Furukawa Hiroshi — Cognitive interface: human interface designs for human-machine collaboration, mental models in dynamic environment.

Misaki Hiroumi — Statistics, econometrics and quantitative finance: high-frequency data analysis, volatility and covolatility of asset prices, financial risk management, state space models, and particle filters.

Cyber Risk

Tsuda Kazuhiko — Database, Information Retrieval, Human Factors, Cognitive Science, Natural Language Processing, Computer Algorithm, Software Engineering.

Yoshida Kenichi — Application of Internet, Data Mining, Artificial Intelligence.

Omote Kazumasa — Countermeasure of Cyber Attacks, Cloud Security, Sensor Network Security, Risk Evaluation in Cyberspace, Applied Cryptography.

Katagishi Kazuki — Energy-saving mobile information communication systems: Hyperfunctions-based "Fluency Information Theory", and its applications to high quality, high compression and secured multimedia coding, Internet security technologies and systems.

Nishide Takashi — Information security: public key encryption, cryptographic protocol, privacy protection, and security techniques for information systems.

Urban Risk

Itoigawa Eiichi — Urban disaster mitigation planning: Mathematical modeling of urban disaster mitigation planning, risk assessment of urban disaster.

Suzuki Tsutomu — Location analysis and risk in urban planning: locational and spatial modeling of urban facilities, transportation networks, infrastructures, public services, urban growth and uncertainties.

Umemoto Michitaka — Countermeasures against infrequent risk in urban and regional area: Evacuation planning, Disaster information, Regionals' countermeasures against nuclear disaster, Perception of disaster risk.

Taniguchi Ayako — Attitude and Behavioral modification concerning urban transportation planning, Mobility Management, Risk Communication.

Environmental and Energy System Risk

Hatano Yuko — Fate and transport of pollutants in the natural environment. Remediation; adsoption; molecular dynamics simulations.

Okajima Keiichi — New energy systems: Risk analysis and LCA evaluation of energy systems with new energy devices such as photovoltaic cell, fuel cell and EDLC systems.

Shoji Gaku — Structural safety and system reliability assessment for critical lifeline infrastructures such as transportation networks, utilities, and communication networks in view of seismic and tsunami risks, and mathematical modeling of public cognition against functional impairment of critical infrastructures during an event.

Suzuki Kengo — Energy system analysis, Energy economics, Gaming simulation, Water transport in fuel cell.

Takayasu Akitoshi — Reliability verification for environmental & mathematical modeling, Computer-assisted analysis & numerical verification for nonlinear mathematical models, Verified numerical computations.