UNDERGRADUATE
Faculty of Humanities and Social Sciences
Faculty of Law
Faculty of Economics and Business Administration
Faculty of Science
Faculty of Urban Environmental Sciences
Faculty of Systems Design
Faculty of Health Sciences

GRADUATE SCHOOL
Graduate School of Humanities
Graduate School of Law and Politics
Graduate School of Management
Graduate School of Science
Graduate School of Urban Environmental Sciences
Graduate School of Systems Design
Graduate School of Human Health Sciences

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Pioneering the global future from Tokyo through the power of scholarship

Tokyo Metropolitan University is the only university operated by the Tokyo Metropolitan Government. It leverages a unique position to provide an education that nurtures human resources who can play an active role in responding to societal changes and to promote varied kinds of basic and applied research as well as research into issues in major metropolitan areas. These activities will contribute to the development of Tokyo and pioneer the global future.

Message from the President

We encourage flexible intelligence in students through high-quality education and guidance

TMU is the only comprehensive university operated by the Tokyo Metropolitan Government. Advancing human knowledge by promoting both basic and applied research in a wide range of fields, while preserving close ties to Tokyo and its residents is the key mission of this university. At TMU, we wish to help young people learn and experience various things and appreciate the joy of discovering something new. The COVID-19 pandemic has greatly affected our lives and social systems, and it has impacted both the mental and physical health of many people. But even in this situation, learning and studying is what makes us human, and human wisdom should be fully exercised to overcome this difficult time.

Now more than ever, we must strongly push forward in our studies and research to advance our wisdom. We will accelerate our work to enhance our research capabilities and promote our international ties under the university vision, with its key phrase “Pioneering the global future from Tokyo through the power of scholarship.” Students are at the heart of this effort. In a place like Tokyo, you’ll have the opportunity to encounter cutting-edge research and the people from around the world who are advancing it. Please build up your capabilities through these opportunities and leap into the world yourself. We will do our utmost to support you in your endeavor.

Our grand vision for the future

1. Positive synergy between advanced research and quality education
   Our faculty of exceptional researchers will enhance the University’s positive synergy between advanced research and quality education by working closely with our outstanding students.

2. Encouraging a commitment to lifelong learning and fostering the ability to collaborate with others to create new values
   We draw a diverse body of diligent students who study a broad range of academic fields. Our students are encouraged to engage in close dialogue with faculty and their peers to broaden their views and enhance their ability to think in greater depth. They also learn to proactively set goals for themselves and collaborate with others to create new values.

3. A campus with great diversity and a rich learning environment
   We are committed to creating a community where a diverse group of individuals of different nationalities, cultural backgrounds, genders, ages, and levels of physical ability study together in an atmosphere of mutual respect. We also provide opportunities for the community and people in and around Tokyo to continue their lifelong education.

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Tokyo Metropolitan University GUIDE BOOK 2024
One of the Fastest in the World! Professor Seiji Yamazoe, Faculty of Science, who has developed a technology for high-speed recovery of CO2 from the air.

The “high-speed recovery technology for carbon dioxide (hereinafter referred to as “CO2”) from the air” is a technology to recover CO2 from the air by adsorbing it in an amine solution and to recover CO2 more than twice as fast as with the conventional method by utilizing the “phase separation phenomenon” in which CO2 reacts with liquid amine to form solid carbamic acid. Furthermore, we have discovered that CO2 can be easily desorbed and recovered by superheating the solid carbamic acid to about 60°C by dispersing it in a solution. Another feature of this technology is that it is more efficient at recovering CO2 than conventional technologies.

Yamazoe: Another important point is that we have created a technology that can be used in a variety of ways. What this technology can contribute most is the realization of carbon neutrality. It is said that if no measures are taken, the temperature of the earth on which we live will increase by more than 1.5 degrees Celsius by 2050, and abnormal weather conditions will increase further. To prevent such a future, it is necessary to recover all CO2 emitted from factories and the energy we use in our daily lives, and “carbon neutrality” aims to achieve zero CO2 emissions in total by 2050.
The Graduate School of Humanities inherits the tradition and scholarship of the former Tokyo Metropolitan University Graduate School over the past half-century, and has newly established the fields of Language Sciences, Expressive Culture Studies, and Japanese Language Education, as well as a Master’s Program in Clinical Psychology, separated from the Department of Psychology. The graduate school consists of four majors.
From “fragmented regional research” to “integrated ocean zone research”

The maritime Asia-Pacific region refers to a borderless region encompassing Japan’s Nansei Islands, Taiwan, China’s southern coastal region, Southeast Asian islands, and Oceania’s islands. These lands also share the feature of being located in an “ocean world.” This research project’s most distinctive characteristic is how it places relative emphasis on the ocean zone more than on the continent. By eliminating the regional research in which divisions were made according to conventional notions of continent-based regions such as countries or regions like East Asia, Southeast Asia, and Oceania, and instead emphasizing the perspective of the ocean, we aim to conduct new regional research in which multiple areas like East Asia, Southeast Asia, and Oceania can be dealt with simultaneously. Historically, the maritime Asia-Pacific has been a region with vibrant mutual exchange of people, things, and information, and that trend has grown stronger and stronger in the 21st century. This research hub focuses on the “fluidity of people and things in island zones” and takes a particularly anthropological perspective from which we investigate and clarify the following: 1) the movement of peoples spanning East Asia, Southeast Asia, and Oceania; 2) the various influences of immigrating peoples on cultures, economies, and the environment; 3) changes in local societal life; and 4) the manifestations of this fluidity as seen in products and scenery.
Graduate School of Law and Politics

This graduate school aims to become a core research facility for law and political science in the 21st century. Based on our advanced research base in these areas, we strive to foster world-class researchers and reflect the results of their research in our advanced professional training programs.

Department of Law and Politics

Division of Law / Division of Political Science

The Department of Law and Politics is divided into the Division of Law and the Division of Political Science, which have separate admission processes, classes, and awarded degrees. Both divisions comprise excellent staff and outstanding learning environments. Graduate students are provided with their own carrel to conduct their research. In addition to many small group seminars (2-4 students in each) held by professors in the department, both divisions hold comprehensive seminars, which encourage interdisciplinary debates among all participating graduate students and professors on affairs relating to present-day society, on a regular basis.

Law School

The Law School aims to develop human resources capable of dealing with the complex issues that arise in a metropolitan area like Tokyo. Classes range from academic theory by scholars to contemporary legal practice by practitioners such as judges, prosecutors, and lawyers. This allows students to receive a balanced and intensive education, to study independently, and to improve their legal skills. The Law School offers two courses: a two-year course mainly for those with a law degree, and a three-year course mainly for those without a law degree. Students graduating from either course will receive a Juris Doctor (J.D.) degree and will be eligible to sit for the National Bar Examination.

Research & Action

Analyze the rationale and efficiency of legal systems using methods and perspectives from law and economics

Professor

GU Dandan

Department of Law and Politics

Case studies on judicial opinions

Question the fairness and consistency in legal systems and their operation

Compare shareholder derivative suits in Japan, US, and China and examine the systems that promote meritorious suits

Legal research includes the disciplines of "law and economics". Traditional legal research places more emphasis on the study of comparative law and leading cases. In contrast, law and economics analyzes legal systems using perspectives and methods from economics. Being a specialist in corporate and commercial law, I bring perspectives from both the traditional legal research and law and economics to my focus on the functions and efficiency of legal systems and on the incentives of interested parties. In the former, if there are choices in the design of a legal system to accomplish a certain goal, we examine which system is the most adequate and cost-efficient for that purpose, while in the latter, we analyze factors that affect the motivation and behavior of interested parties within a given system. This is the viewpoint from which I am researching shareholder derivative suits, in order to reveal a more rational system through the analysis of various systems in Japan, the US, and China. In Japan and the US, where you can file a suit if you own one share, there are misgivings that these systems may be abused or misused, therefore, it is important to equip them to end deleterious suits, including by dismissal or settlement. In contrast, in China, where shareholders cannot file a suit unless they own a certain percentage of the outstanding shares, a system has taken effect since 2006 but has seldom been put to use. I am looking into the desirable design of systems for promoting meritorious shareholder derivative lawsuits, which hold managers responsible for their actions against companies, while also posing the same questions to my students.
With the globalization of the economy and the rapid spread of the Internet, the framework of economic activities is changing day by day, and Tokyo Metropolitan University strives to reflect the results in both academic and practical aspects of its master’s and doctoral programs. To this end, we offer three master’s programs in business administration (MBA), economics (MEc), and finance (MF), as well as a doctoral program that covers the same fields as the master’s program.

Business Administration Program
The Business Administration (MBA) Program aims to nurture highly-skilled professionals with advanced management know-how, strategic thinking skills, and the ability to work in an international environment, as well as researchers who are well versed in all theories of business administration and can open up new avenues in business administration research.

The MBA program actively accepts not only students from the humanities and social sciences, but also students from the sciences who have not studied business administration or economics in their undergraduate studies.

Economics Program
The Economics (MEc) program is designed to train researchers and practitioners who have expertise in economics-related fields and who are capable of conducting research in a wide range of areas relevant to academic and practical issues. The goal of this program is to equip students with the necessary knowledge, skills and approaches to be able to analyze economic activities, formulate intelligent economic policies and propose ways to make organizations more efficient, as well as to apply relevant economic theories effectively, whether they work in government agencies, think tanks or corporations.

Finance Program
In addition to the core curriculum of investment management, derivatives, financial risk, and corporate finance, the Finance (MF) program offers a carefully designed curriculum that effectively balance related subjects such as mathematics, numerical analysis, statistics and data science, economics, strategic financial management, and business strategy in order to systematically acquire a wide range of knowledge and skills in finance and corporate management.

Understand the changes in consumption style flowing from digital transformation
In the context of turmoil due to the COVID-19 pandemic, the “digital” world is again making its presence strongly felt. Zoom and Teams are now used as a matter of course even in educational settings, not to mention GAFA, the four tech giants of the digital age. Digital transformation such as this will further accelerate in the future, and economics, management, and society as a whole can no longer ignore the digital world. Why did GAFA become gigantic companies and what impact are they having on the world economy? So, how should we approach economics and management in this digital age? Every company is different now from how it was at its beginning and economies are also changing, even though capitalism is not. Above all, we should direct attention to the fact that our consumption styles themselves have changed greatly through digital development. The internet is awash with posts by people across the globe, sometimes shaping widespread opinion, mobilizing society, and even impacting politics. “Fake news” is rampant and sometimes leads people in the wrong direction. Digital transformation will continue occurring because we want them to, and the arrival of the digital age will continue changing economics and management. Thinking on management needs to be based on understanding of this circulation mechanism.
Department of Chemistry

Chemistry is a discipline that lies at the heart of the natural sciences. The goal of chemistry is to create new substances by transforming molecular structures and to explore the structure, properties, and reactivity of those substances. This goal is what drives the Department of Chemistry. Because the applications of modern chemistry are so broad and diverse, including the development of chemical materials and materials used in electronic devices, as well as other applications in space, the life sciences, and the environment, this department has established three separate research programs: 1) inorganic and analytical chemistries, 2) organic chemistry and biochemistry, and 3) physical chemistry to support a wide range of academic pursuits. The graduate school cultivates researchers and engineers who are equipped with advanced knowledge in cutting-edge fields of chemistry, grounded in a deep level of expertise, as well as a broader, more comprehensive sense of judgment that goes beyond their field of specialization.

Department of Physics

The aim of physics is to clarify fundamental laws of nature and to apply the knowledge and results to science and engineering. Our department consists of four research groups: 1) theoretical astrophysics and particle physics; 2) theoretical condensed matter physics; 3) experimental astrophysics and particle physics; and 4) experimental condensed matter physics. These groups cover a broad spectrum of research fields including microscopic elementary particles, condensed matter, and the macroscopic universe. Each group is further divided into subgroups to achieve highly effective research and education. In this way, the department seeks to cultivate, for the benefit of society, flexible, multi-faceted human talent that includes researchers capable of innovative thinking and educators equipped with a wealth of specialist knowledge.

Department of Biological Sciences

One of the greatest features of the Department of Biological Sciences at Tokyo Metropolitan University is the diversity of its research fields and professors. The faculty members are all engaged in diverse research across the fields of biology and life sciences. We conduct research using a wide variety of organisms at all levels, from genes and cells (genetics, cytology, physiology, embryology) to individuals, species, and ecosystems (ecology, phylogeny, evolution), and from microorganisms to higher animals and plants. With a diverse faculty, graduate students in our department are able to learn from experts in a variety of life science fields. This means that no matter what field a graduate student is interested in, there is a professor with expertise that connects in some way to that topic. Also, if you are interested in biology or life sciences but do not know what exactly you want to research, you can find a research theme that suits you.

Department of Mathematical Sciences

The Department of Mathematical Sciences at the Graduate School of Science aims to lead students toward the leading edge of the contemporary mathematical sciences by providing a systematic theoretical grounding in the areas of algebra, geometry, analysis and applied mathematics, and through self-directed study based on the problem-solving approach. With a teaching and research framework that flexibly and organically integrates the four key fields noted above, students are able to accumulate multi-layered mathematical experience and cognitive training. In this way, the department seeks to cultivate, for the benefit of society, flexible, multi-faceted human talent that includes researchers capable of innovative thinking and educators equipped with a wealth of specialist knowledge.

Department of Biological Sciences

Section of Biology / Section of Biomedicine and Biotechnology

One of the greatest features of the Department of Biological Sciences at Tokyo Metropolitan University is the diversity of its research fields and professors. The faculty members are all engaged in diverse research across the fields of biology and life sciences. We conduct research using a wide variety of organisms at all levels, from genes and cells (genetics, cytology, physiology, embryology) to individuals, species, and ecosystems (ecology, phylogeny, evolution), and from microorganisms to higher animals and plants. With a diverse faculty, graduate students in our department are able to learn from experts in a variety of life science fields. This means that no matter what field a graduate student is interested in, there is a professor with expertise that connects in some way to that topic. Also, if you are interested in biology or life sciences but do not know what exactly you want to research, you can find a research theme that suits you.
New mechanism of virus immunity controlled by the proteolysis system

Biology textbooks depict how proteins are expertly produced through the transcription and translation system. However, the process of actual protein synthesis in the cell does not necessarily have a high success rate. Even our healthy cells generate a huge amount of defective proteins all the time. In our research lab, we have discovered a new intracellular system that recognizes newly synthesized and defective proteins and guides them to the degradation system.

The degradation products of defective proteins have recently been attracting attention. It is now known that, rather than being useless waste products, they fulfill a necessary role in the immune system. The peptide antigens targeted by the lymphocytes are the degradation products of the defective proteins we are researching. For example, inside cells infected by a virus, degradation products of the virus proteins encourage activation of lymphocytes by becoming peptide antigens. The widely-promoted COVID-19 vaccines work by generating and degrading defective proteins derived from the virus in our cells to actively generate peptide antigens which are targeted by lymphocytes.

In our university research lab, we are proactively engaging in fundamental research into proteolysis in order to serve a role in the future development of new vaccines.

New mechanism of virus immunity controlled by the proteolysis system

Discovery and explication of an intracellular system that recognizes and guides newly synthesized and defective proteins to the degradation system
Graduate School of Urban Environmental Sciences

Department of Geography

The geographic environment consists of natural and human-created environments, and the space extends in scale from cities and regions to nations, continents, and the earth. Geography is not just the study of the dynamic interrelationships between the geographic environment and humans from the past to the present in a given space. Rather, it aims to explain events by taking into account the interrelationships among phenomena occurring at various spatial scales. This is especially important when studying phenomena occurring on a global scale, such as global warming and economic globalization. Research on a wide range of issues, such as the relationship between environments and humans from the past to the present in a given space. This is especially important when studying phenomena occurring on a global scale, such as global warming and economic globalization.

Department of Civil and Environmental Engineering

Civil and Environmental Engineering, as suggested by the title, is a discipline that serves citizens, and its goals are to build sustainable national lands and cities, to build living environments that offer safety and security, and to create rich social foundations. The title covers a wide range of activities from the planning, construction, management, and maintenance of infrastructure to the preservation of urban and natural environments. It also includes disaster management efforts that aim to protect people’s lives and property. In this department, students systematically conduct research in the field of civil and environmental engineering from the three perspectives of infrastructure, environmental systems, and safety and disaster prevention. Students learn a wide range of theories and techniques related to architecture and develop highly specialized skills to solve architectural problems. In the Basic Research Course, which covers the fields of architecture, urban planning, and architectural history and design, students engage in advanced and practical research to solve complex problems. In the Project Research Course, multiple faculty members specializing in different academic disciplines form project teams to conduct research and acquire the practical skills to discover and solve complex problems in the world of urban planning and architecture.

Department of Architecture and Building Engineering

The Department of Architecture and Building Engineering aims to promote and practice research on the construction of architecture and urban spaces in a sustainable society, and to develop human resources who can play a role in this research. Students will conduct research to create safe, comfortable, and attractive architectural and urban spaces while properly maintaining and managing existing buildings and reducing their environmental impact. Students learn a wide range of theories and techniques related to architecture and develop highly specialized skills to solve architectural problems.

Department of Applied Chemistry for Environment

This department cultivates creative engineers and researchers capable of playing a leading role in applied chemistry and material chemistry to achieve sustainable development using resources and energy in harmony with the environment. The department has developed educational offerings aimed at imparting the kind of basic chemistry knowledge needed for solving various problems that persist in cities, which feature high concentrations of matter and energy. The department engages in education and research focused on teaching students to exercise autonomy and to develop their ability to find and solve problems. The department cultivates engineers and researchers with a broad perspective and the ability to demonstrate leadership in the 21st century by promoting cutting-edge research around key themes such as environment, energy, bio, and nano-technology in such research areas as analytical chemistry, polymer chemistry, organic chemistry, biochemistry, complex chemistry, inorganic chemistry, electrochemistry, chemical engineering, interface chemistry, and atmospheric chemistry.
The Department of Urban Science and Policy is dedicated to the cultivation of human talent capable of developing a comprehensive picture of the modern city with its dynamic transformations, visualizing how cities can become safe, comfortable places where residents enjoy peace of mind, and undertaking analysis and research from spatial, systemic, social and other perspectives, thereby helping to realize sustainable urban development.

In addition to providing a multidisciplinary curriculum that teaches the techniques needed to analyze urban phenomena and helps students develop a multi-faceted understanding of the types of public policy that can be applied in different areas, the department also incorporates practical learning activities involving collaborative research with the public agencies responsible for drafting urban development policy, private-sector firms, NPOs, local community organizations, etc.

Future projections based on basic ecology and proper allocation of extermination efforts

Establishing a method for predicting the spread of the target species is an effective means for appropriately allocating management efforts spatially. This is akin to making a weather forecast that considers invasive alien species as bad weather. If a certain level of reliability can be ensured, despite the uncertainty, it will be possible to make a decision to carry out extermination activities or not based on the results, just like deciding whether or not to take an umbrella with you based on the probability of rainfall. One of the themes we are working on in our laboratory is predicting the spread of invasive alien species. In recent years, we have been particularly active in research aimed at predicting the spread of target species by conducting computer simulations based on their basic ecology, which contributes to the efficiency of extermination measures. In recent examples, we conducted a study to predict the spread of white popinac, an invasive plant that is spreading in the Ogasawara Islands, and the red-necked longhorn beetle, an invasive insect that kills cherry and peach trees, and to identify areas where extermination efforts should be focused. Carrying this out requires both basic knowledge of the target species and the technology to handle high-performance computers, making this research a very interdisciplinary effort.
The five departments are the Department of Computer Science, the Department of Electrical Engineering and Computer Science, the Department of Mechanical Systems Engineering, the Department of Aeronautics and Astronautics, and the Department of Industrial Art. These are developed through the system design education provided by each department and through pioneering and creative research activities.

#### Department of Computer Science

In our modern era, information technology permeates all aspects of our social lives and actions. While creating dramatic changes that improve efficiency and quality, technological innovation continues at a dizzying pace. At the same time, unforeseen technological challenges continue to appear, from the safe operation of information systems to risk management of security threats. In the Department of Computer Science, we aim to train technologists and researchers capable of solving these challenges.

- **Professional Conduct.** Students acquire advanced skills and problem-solving abilities, as well as an understanding of ethical and professional conduct.
- **Creative Research Activities.** Creative research activities are supported by each department and through pioneering and frontier research, where our mission is to prepare students to be engineering leaders and world-class scientists. To these ends, our department emphasizes three key research areas: Electrical Engineering and Computer Science (EECS), computer networks and systems, telecommunication and sensing systems, and electrical engineering. With comprehensive knowledge of electrical engineering and computer science, we help students acquire advanced skills and problem-solving abilities, as well as an understanding of ethical and professional conduct.

#### Department of Electrical Engineering and Computer Science

Electrical Engineering and Computer Science (EECS) technologies, including computers, telecommunications, electronics, and electric power, undoubtedly lie at the very heart of modern society and are certainly moving forward the frontiers of industry. In addition, EECS shall play a critical role in creating disruptive technologies. In this context, the Department of Electrical Engineering and Computer Science is the focal point for advanced education and frontier research, where our mission is to train technologists and researchers to succeed on a global scale, to obtain mastery of both fundamental technologies and specialized knowledge, to impart the ability to support the development of ever-evolving information technology and to impart decisiveness to deal with risks appropriately.

- **Mechanical Innovation.** The department provides instruction in concepts and theories related to functional materials and manufacturing, basic measurement technology, basic methodologies and their application for creating and producing more effective medical support for citizens, students study fields related to medical bioengineering, biomechanics, ergonomics, and welfare engineering, and then advance to existing specialized fields.
- **Intelligent Mechanical Systems.** In order to realize a “safe, secure and sustainable society,” students study fields related to mechanical control and intelligent systems, surveillance informatics, and robotics, and advance to existing specialized fields.
- **Biomechanical Engineering.** To realize “advanced medical care and effective medical support for citizens,” students study fields related to medical bioengineering, biomechanics, ergonomics, and welfare engineering, and then advance to existing specialized fields.

#### Department of Mechanical Systems Engineering

The Department of Mechanical Systems Engineering is based on the education of advanced mechanical systems engineering to realize safe and comfortable urban life and sustainability of the global environment and human society.

- **Mechanical Innovation.** The department provides instruction in concepts and theories related to functional materials and manufacturing, basic measurement technology, basic methodologies and their application for creating and producing more effective medical support for citizens, students study fields related to medical bioengineering, biomechanics, ergonomics, and welfare engineering, and then advance to existing specialized fields.
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- **Biomechanical Engineering.** To realize “advanced medical care and effective medical support for citizens,” students study fields related to medical bioengineering, biomechanics, ergonomics, and welfare engineering, and then advance to existing specialized fields.

#### Department of Aeronautics and Astronautics

Aerodynamics and Fluid Dynamics laboratories are conducting research on flow control for reduction of aerodynamic drag and sound, high-speed aerothermodynamics, and magnetohydrodynamics. Propulsion Systems laboratories are pushing the limits of propulsion technology for rocket engines and spacecraft based on the physics of thermal fluids. Materials and Structures laboratories are studying the development of new light metals and composites, and the structural mechanics of large light space structures. Guidance, Control and Dynamics field includes research on the dynamics and control of spacecraft, air traffic management, analysis, and trajectory optimization.

Systems Design Engineering field includes research on design methodologies and their application for creating and producing more superior components and systems of aircraft and spacecraft. Space Utilization Technology laboratories are conducting research and development in remote sensing, satellite communications, and key elemental technologies for space systems.
Department of Industrial Art

As we ride the current waves of intense social change, shifting values, and new technological innovations, there is a strong need for creative thinkers who are flexible, original, and capable of taking charge and quickly adapting to these new developments. To meet the needs of contemporary society, this department aims to cultivate a new type of designer who researches, creates, practices new approaches, derives new concepts and envisions playing a leading role in changing the social framework.

Students are therefore encouraged to choose cross-sectional, multi-layered research topics that cover a wide range of design-related fields that incorporate engineering elements as well as socio-cultural elements. The department has two programs: Product Design and Media Creation. In the Product Design Program students develop designs that benefit both people and the environment, such as the design and engineering of transportation systems, industrial products and habitable spaces. In the Media Creation Program, students create new ways to communicate through a combination of cutting-edge media technologies and artistic sensibilities. By working across both fields, students are able to gain broader perspectives.

Organizational Structure of the Research Center for Medicine-Engineering Collaboration

Seeking to improve therapeutic effect by including new methodologies for treatment of locomotor system diseases and injuries

In this super-aging society of ours, locomotor system diseases and their resultant reductions in quality of life (QOL) have become major societal issues. Additionally, the prominence of sports also causes many locomotive injuries, which is another major problem.

At the Tokyo Metropolitan University Research Center for Medicine-Engineering Collaboration, we seek to address these problems combining a medical/biological perspective with a mechanical/engineering approach and are focusing on two areas of research: nano/micro-level research on cellular functions and properties, and macro-level research on organs such as joints.

In our nano/micro-level research, we receive research support from the Tokyo Metropolitan Government Advanced Research Grant and others, as we work to clarify basic mechanisms in stem cell differentiation from the perspective of the mechanobiology research field, which clarifies the relationship between the mechanical environment and cellular function, and take on the challenge of establishing regenerative medicine technology that creates complex living tissues, such as cartilage-bone junctions, in a culture environment. In the macro-level research, for which we receive support from the Japanese Agency for Medical Research and Development (AMED), we cooperate with medical doctors and researchers in other universities and medical device companies to take on the challenge of creating and developing revolutionary medical technology optimized for each patient’s surgical operations, such as artificial joint surgery.
Department of Nursing Sciences

With a specific focus on the people who live in large cities and on promoting community health, this department contributes to the health of individuals and groups through education and research in the nursing sciences as it strives to improve quality of life and to achieve a vibrant and long-lived society.

The master’s program offers master’s thesis courses in the following fields: nursing ethics and management, reproductive health nursing, child health nursing, adult health nursing, medical life support nursing, community mental health nursing, home care nursing, international nursing/medical anthropology, public health nursing, and midwifery. There are certified nurse specialist courses for child health nursing. The doctoral program cultivates individuals who can serve as leaders in the fields of the nursing sciences and public health.

Department of Physical Therapy

This department is divided into three research programs. These are Movement Disorder Analysis and Physical Therapy (Pediatric Physical Therapy, Preventive Physical Therapy, Cardiopulmonary Physical Therapy, Neurocognitive Therapy, Neuroscience-founded Physiotherapy), Physical Function Recovery Physical Therapy (Orthopaedic Physical Therapy, Musculoskeletal Physical Therapy, and Adapted Sports Physical Therapy), Women’s and Men’s Health Physical Therapy, and Community-based Physical Therapy. The program promotes systematic and comprehensive learning of physical therapy knowledge, skills, and scientific thought processes related to health and disability. It also promotes research and development of advanced physical therapy techniques related to the prevention of physical disability and functional recovery from developmental and chronic diseases and lifestyle-related diseases, and research related to the promotion of health management and social participation of people in local communities.

Department of Occupational Therapy

The department of occupational therapy aims to contribute to the realization of a society where people live long vibrant healthy lives. Foci are on developing the potentials of occupation, occupational therapy practices (including health promotion), and accumulation of its evidence. It is divided into three research programs. Holistic Occupational Therapy in Human Life focuses research on mental and psychological health of children to older adults, and on the intersection of occupational therapy with human physical and cognitive (dis)functioning and child development. Occupational Behavior and Occupational Science concerns occupational behavior and science, (community) occupational therapy for mental health and older adults. Occupation and Living Environment Studies encompasses occupational life design studies, assistive products and technologies, occupational performance analysis, and analysis and adaptation of the environments of people’s daily lives.

Department of Radiological Sciences

The objectives of this major are (1) to develop advanced radiology specialists who can apply creative and scientific thought processes, and (2) to develop human resources who not only have advanced knowledge and skills in their own specialized fields, but who also understand the results of research in other fields and can integrate this information to develop advanced medical technologies. In the master’s program, each field in the Dept. of radiological sciences has adopted a comprehensive curriculum, taking into consideration students from science and engineering departments and other graduate schools. In addition, we strive to train medical physicists who are certified by the Japanese Board for Medical Physicist Qualification (JBMP). Diagnostic equipment such as X-ray CT (MDCT) and MRI, as well as radiation therapy equipment such as unsealed radioisotopes (RI) facilities and using a modern linear accelerator are available on campus, allowing for a full range of experiments and research.

The Graduate School of Human Health Sciences is comprised of six departments: Nursing Sciences, Physical Therapy, Occupational Therapy, Radiological Sciences, Frontier Health Sciences (all of which are on the Arakawa Campus), and Health Promotion Sciences (Minami-Osawa Campus).
Department of Frontier Health Sciences

The department consists of three regular programs. (1) Functional Morphology conducts research in three areas: research on the morphology and location of internal organs and autonomic nerves and their clinical applications, research on the physiological mechanisms of visceral fat accumulation, and analysis of pancreatic pathologies such as pancreatic cancer. (2) In muscle physiology, research on the structure and function of the contractile apparatus that maintains the structure of muscle cells is carried out. (3) In Evaluation and management for social health, medical welfare, and various disasters, research will be conducted primarily on quantitative study design, methodology of epidemiological studies, and techniques for generating health statistics to evaluate aspects of care for nurses trying to contribute to the community.

Department of Health Promotion Sciences

The Department of Health Promotion Sciences strives to equip students with specialized knowledge of human beings and health, as well as advanced problem-solving skills, through basic and applied research related to health maintenance and improvement. The department’s goal is to cultivate advanced specialists with a wide range of knowledge and independent researchers who can communicate with people not only in their own field of specialization, but also with people in other disciplines. There are some extremely complicated factors underlying the various problems related to human health. Solving those problems is going to require an understanding of those factors, the ability to grasp the overall picture of the situation created through interdisciplinary investigations in a variety of fields, and an explanation of the action mechanisms of the constituent factors.

Realtime, in vivo confirmation of radiation dose in patients undergoing radiotherapy

Developing a measuring device which may become a gold standard for in vivo dosimetry

- Evaluating the accuracy of radiotherapy
  Safely administering radiotherapy with a high level of accuracy requires proper management and evaluation of the radiation dose applied to the patient.
  Our research team is working to develop a method of in vivo dosimetry and a dedicated radiation dosimeter in order to directly confirm whether the applied radiation dose is correct during radiation therapy. This method directly measures the radiation dose during therapy through the use of a radiation dosimeter inserted into the patient’s body, and is the only means of directly measuring the dose actually applied to the patient. Our research team has become the first in the world to succeed at measuring in vivo dose in patients during carbon ion radiotherapy.

- Towards standardization of measuring devices
  There has not been an in vivo dosimeter capable of handling all of the conventional diverse radiotherapies, so development has been an urgent need. Regarding this task, our research team has advanced research into using a radiation dosimeter we developed to realize standardization of in vivo measurement. In order to deal with X-ray and proton beam therapies, we performed experiments specifically aimed at acquiring radiation dosimeter response characteristics for each radiation type, and have obtained good results. This result shows, the radiation dosimeter we are developing is likely to create a gold standard for in vivo dosimetry. We believe that continuous research and development of the dosimeter will help promote more precise radiotherapy.

Associate Professor
MATSUMOTO Shinnosuke
Department of Radiological Sciences

- Efforts to Improve Dosimetry Techniques
  - Standardization of In Vivo Dosimetry Techniques
  - Ongoing Research and Development
  - New Value of Utilization
  - Promotion of Utilization
  - Appropriate Radiation Therapy
  - Cancer Suppression
  - Protecting Healthy Tissue

Graduate Schools

Department of Radiological Sciences

MATSUMOTO Shinnosuke
Associate Professor

Tokyo Metropolitan University GUIDE BOOK 2024
### Undergraduate

**Learning to explore the city beyond the boundaries of academic disciplines**

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<th>category</th>
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<th>Economics/Business Administration</th>
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The "English Program in Biological Sciences, Faculty of Science," where you can earn a degree in English

This program allows students to earn their degree in English. All 124 credits of coursework and laboratory work required for graduation from the Department of Biological Sciences are offered in English. The program can be combined with courses offered in Japanese. Courses are offered in a wide variety of fields, including molecular evolution, ecology, systematics, genetics, neuroscience, cell biology, and physiology. Courses in the humanities are also offered in English, and can be taken in combination with courses offered in the main course. (For details, please go to the web)
Research Center Core

Research Center for Space Science
Research Center for Space Science brings together space-related research groups at Tokyo Metropolitan University, allowing them to deepen their collaboration across research fields and develop their research capabilities. The purpose of this center is to consolidate the power of research in space science and to produce more advanced results.

Research Center for Genomics and Bioinformatics
Research Center for Genomics and Bioinformatics is a center for organic cooperation among researchers in related fields. The center aims to be an internationally competitive research and education center in the field of evolutionary genomics and bioinformatics.

Research Center for Water System Engineering
Research Center for Water System Engineering promotes research on water supply systems that maintain water supply facilities in a sound condition and enable the sustainability of high-level water supply in the future. The center will draw up a future vision for next-generation water supply systems from a broad perspective based on a joint industry-government-academia framework.

Research Center for Climatology
The Center's research focuses on the mechanisms of Asian monsoon variability, extreme weather, and the formation of urban climates. We are also conducting research on forecasting methods to minimize the damage caused by extreme weather events from a wide range of perspectives.

Research Center for Social Big Data
Research Center for Social Big Data builds an integrated infrastructure for discovering and utilizing new value and knowledge from real-world data and open data, using social data as a medium. In particular, we are focusing on the methodology of integrated hypothesis formation based on heterogeneous data and its application to social infrastructures and sciences.

Research Center for Child and Adolescent Poverty
Research Center for Child and Adolescent Poverty clarifies the full range of problems faced by children in poverty, and elucidates the mechanisms of the cycle of disadvantage. It also explores what kind of support is effective and makes evidence-based policy proposals to the national and local governments.

Research Center for Quantitative Finance
Research Center for Quantitative Finance was established in accordance with the Tokyo Metropolitan Government’s “Tokyo International Financial Center Initiative.” As a leading academic research center for the realization of the plan, the center aims to develop academic research in financial engineering and promote international exchange.

Research Center for Hydrogen Energy-based Society
This is a research center that focuses on a wide range of topics, from the development of highly efficient energy utilization systems using hydrogen to the development of infrastructure for such systems. This center is unprecedented in the world, and we aim to develop it as a research center that will appeal to the world.

Research Center for Medicine-Engineering Collaboration
Research Center for Medicine-Engineering Collaboration is developing as a center for collaborative medical and engineering research that covers both basic and clinical medical fields by utilizing the latest science and engineering technologies, such as nanomaterial processing, material generation, biomechanics, and mechanobiology, in which the Department of Mechanical Systems Engineering at Tokyo Metropolitan University.

Research at Tokyo Metropolitan University has produced excellent results in each specialized area. Currently, 13 research centers have been established to disseminate research results both inside and outside the university. In addition, new “Research Cores” have been established for research groups with outstanding achievements that aim to form a new research center.

Research Center for Quantum Material Science and Engineering
Research Center for Quantum Material Science and Engineering studies superconductivity in molecular conductors, transition metal compounds, rare earth compounds, and actinide compounds, and contributes to the development of the field. The center promotes research on new Bi2x-based layered superconductors originating from Tokyo Metropolitan University, and is developing as a center for superconductivity research.

Research Center for Energy Integrity Systems
In order to effectively use electric energy while achieving carbon neutrality, it is essential to integrate and link energy control and information and communication technologies. The research center will conduct research aimed at realizing the construction of fundamental technologies for energy networking.

Research Center for Hazard Mitigation in Volcanic Islands and Urban Areas
Research Center for Hazard Mitigation in Volcanic Islands and Urban Areas is a research center of a public university that plays a particularly important role in the local community by providing the latest information on newly recognized risks to the community.

Research Center for Community-centric Systems
The research center aims to provide data-based solutions to Tokyo’s important issues, such as disaster prevention community building and health and welfare, by combining the internationally strong field of informatics and social robotics with the growing field of big data.

Research Core for serBOT in Q
Research Core for serBOT in Q is an incubation hub that integrates research on social implementation of service robots using design thinking and research on the technical elements of service robots with the aim of solving urban problems. We aim to establish a product development process based on cross-disciplinary knowledge and technology, and through collaborative creation among different industries and fields.

Research Core for Interdisciplinary Advanced Computing
The purpose of this research core is to share, categorize, and organize information on computational technologies and algorithms that provide a common foundation in the fields of natural and social sciences, and to contribute to and develop solutions for financial, environmental, disaster prevention, and security issues in the metropolitan area.

Research Core for Language, Brain and Genetics
Research Core for Language, Brain and Genetics is the world’s first research center that integrates the humanities and the sciences to address the issues of language, brain, and genes. The goal of the research core is to combine the efforts of researchers in the field of brain genetics of language in order to elucidate the relationship between language and human nature, and to produce even better research results.

Research Core for Meta-Healthcare
This research core consists of researchers from different fields such as physiology, human neurosciences, engineering, and experimental psychology. We aim to construct an ecosystem that solves various problems associated with healthcare by using technology of bodily augmentation in the Metaverse or virtual space, and to practice it.
1: Campus Information

Minami-Osawa Campus

Address: 1-1 Minami-Osawa, Hachioji-shi, Tokyo 192-0397, Japan
Tel: +81-42-677-1111

Arakawa Campus

Address: 7-2-10 Higashi-Ota, Arakawa-ku, Tokyo 116-8551, Japan
Tel: +81-3-3819-1211

Hino Campus

Address: 6-6 Asahigaoka, Hino-shi, Tokyo 191-0065, Japan
Tel: +81-42-585-8606

Campus Store
Student Dormitory
Library
Exercise Facilities
2: Research Related Facilities

1. RI Research Facility
This facility is used for research involving radioactive isotopes (RI) and radiation at the Minami-Osawa campus. Various types of monitoring apparatuses and radioactivity control systems ensure that the RIs and radiation apparatuses are used for their intended purposes and are handled safely at all times. At present, approximately 400 teaching staff and students are registered as authorized researchers.

2. Physical Education Facility
We conduct research on a wide and integrated scale from the molecular, gene, and cell level to human applications in our aim to solve and gene problems related to the maintenance promotion of health in an aging society.

3. The Makino Herbarium
The Makino Herbarium was founded in 1958. It contains Dr. Tomitaro Makino's collection of "type specimens," which formed the basis of his description of new wild Japanese plant species, specimens obtained through duplicate specimen exchange, and more collected from other areas, totaling about 500,000. Staff study taxonomy, phylogeny and biogeography using modern equipment and classical taxonomical methods.

4. Manufacturing Facilities
This facility supports state-of-the-art research through the development of prototypes for research equipment and the processing of data. Students receive hands-on training in various types of machine tools to improve their basic manufacturing skills.

5. Science and Engineering Research Facility
This facility is used for research in the latest fields of study. It is outfitted with a variety of equipment to support advanced experiments. Experiments are related to precise analysis and electron microscopy, high-density energy involving lasers, and engineering works and landforms.

6. Wind Tunnel Facilities
Aerodynamics and Fluid Dynamics laboratories are equipped with various wind tunnel facilities such as a large-scale subsonic wind tunnel, a low noise and low turbulence wind tunnel and a supersonic wind tunnel to support education and research activities in aerodynamics and fluid dynamics.

7. Medical Linear Accelerator Facility
This facility conducts research and education on radiotherapy technologies using a modern linear accelerator.

8. Ogasawara Field Research Station
Ogasawara Field Research Station was established in 1971, rebuilt in 1982, and has served as a base for research and education. Research there is published in Ogasawara Research and The Annual Report of Ogasawara Studies. Such studies contribute to the formation of policies regarding nature conservation and management by the Ministry of the Environment, Tokyo Metropolitan Government, and Ogasawara Village.
The mission of the International Center is to promote the further internationalization of Tokyo Metropolitan University through academic collaboration with foreign universities and the acceptance of overseas students and researchers in order to achieve higher-level research, and international cooperation on global and other issues. The International Center performs the tasks of planning for various aspects of international exchange and establishing agreements on academic cooperation with overseas universities. The Center also provides support for international students and assistance for students planning to study abroad.

TMU signs agreements with universities and other higher education institutions around the world to promote international cooperation in education and research as well as student exchange.
International Students

Student Profile

- Total: 529
- Graduate: 73%
- Undergraduate: 17%

International Student Support

Advising Services
International Student Advising Office provides support to international students at TMU. International student advisors help students find effective solutions to their daily problems involving academic work, interpersonal relationships, life in Japan, etc...

All consultations are kept strictly confidential.

Japanese language classes
TMU provides Japanese language classes from beginner to advanced level (N5-N1+).

Career development
The International Center at TMU offers courses aimed at developing competence in practical Japanese in academic and business settings to prepare graduate students for the future of work in Japan.

International Activities

Special Program For Exchange Students

Semester Abroad at Tokyo Metropolitan University (SATOMU)
SATOMU is a study program designed for exchange students from TMU’s partner universities. The program offers courses in a wide range of academic disciplines taught in English and Japanese language courses at all levels from beginner to advanced.

Japanese language and cultural immersion program
TMU offers an intensive Japanese language and cultural immersion program in both summer and winter to meet the needs of exchange students who look for short-term study options. The program consists of intensive language instruction, interactive cultural activities and various excursions.

Accommodation

Tuition and Scholarships

Course | Registration | Tuition
--- | --- | ---
Undergraduate | 282,000 yen | 530,800 yen
Graduate | 282,000 yen | 530,800 yen

Learn through a highly flexible curriculum in the future I want to be a bridge connecting Japan to the world
I entered TMU from a Japanese language school, and am studying business administration. There is a broad scope of learning involved with it. I find marketing and finance particularly interesting. I want to deepen my knowledge because finance is used all over the world and should have a wide range of uses in the future. Taking classes and exams in Japanese is difficult, but I have acquired a body language unique to Japan. The TMU curriculum is very flexible, and within business administration, the only two courses required are English and information. I can concentrate on the subjects I want to focus on because I do not have to take Japanese courses like at other universities. After graduation I want to work in Japan. I want to improve my Japanese so I can work without difficulty and become a bridge connecting Japan to the world.

An international student from Sweden

Franzén Emanuel

International Student House

Student Dormitory
Communal area (International Student House)

Graduate
Undergraduate

Others
10%
73%
### TMU Key Facts

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<th>Number of FTE Students</th>
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<td>Number of Students per Faculty Member</td>
<td>10.42</td>
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<tr>
<td>Number of Faculty Member</td>
<td>654</td>
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<tr>
<td>Number of International Students</td>
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| Percentage of International Students | 5.8% |
| Student Ratio of Females to Males | 39:61 |
| Finance per Student(¥000s) | ¥2,619 |
| Minami – Osawa Campus (m²) | 428,041 |

### Study in Tokyo, Japan

**The appeal of studying in Tokyo, Japan**

Japan is a country where a unique traditional culture, which has been passed down from generation to generation over the long course of history, and the leading-edge technology co-exist in harmony. The capital city, Tokyo, serves as the core of Japan’s economy, politics and culture and is one of the leading cities in Asia for the development of economies and high-tech industries. In an inner-city area packed with towering skyscrapers, once you take a step inside an alley, you will see shrines and temples, as well as a rich natural environment if you go further out in the suburbs. In this way, life in Tokyo not only provides a high level of education, but also traditional culture, cutting-edge culture, and a rich natural environment, creating a wonderful opportunity for international students to learn just by living in the environment.

### Academic Calendar for Tokyo Metropolitan University

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As of May 2022

### Cost of living

**Guide for living expenses**

The amount varies depending on the region.

- **Food**: ¥30,000 yen per month
- **Rent**: ¥50,000 yen
- **Utilities (electricity / gas / water)**: ¥3,000 yen
- **Insurance, medical expenses**: ¥6,000 yen
- **Hobbies, entertainment**: ¥109,000 yen
- **Hobbies, entertainment**: ¥109,000 yen

Referenced: Lifestyle Survey of Privately-Financed International Students 2021 (JASSO)