

## Department of Architecture and Building Science

1 . Department of Architecture and Building Science consists of following Core Laboratories. [The figure in parenthesis indicates the number of laboratories.]

① Core Laboratories

Architecture and Urban Design Course (5), Architecture and Urban Planning Course (8), Sustainable Architecture and Building Science Course (5), Structural Engineering for Architecture Course (8)

2 . Department of Architecture and Building Science deals with very wide research area regarding architecture, buildings, urban and other related issues. Candidates who belong to other faculties or departments are recommended to understand their desired research area in advance. You may need to consult with the department and your prospective supervisor(s).

Laboratory	Professor / Associate Professor	Theme of research
Architecture and Urban Design Course (Urban Design Lab.)	Professor Toshikazu ISHIDA	In response to the paradigm of "shrinking and mature", we will explore "the optimum environment of cities and areas, and further how the framework of various principles that form the basis of its construction will change" and in the coming era. In this field, we aim to research and propose the way of cities, areas, and architecture in the next generation social model.
Architecture and Urban Design Course (Architectural Design Lab.)	Professor (Concurrent post) Taro IGARASHI	This laboratory studies on architectural design, examining form, spatial composition, function, structure and competition, Connection between architectural design and other genre (contemporary art, cinema and so on) will be also important theme to open up new expression.
Architecture and Urban Design Course (Urban and Architectural Design Theory Lab.)	Professor Taro IGARASHI	This laboratory studies on theory and criticism which influenced the trend of urban and architectural design. In our research, Media (exhibition and magazine) is considered as an effective tool to declare radical design and theory too.
Architecture and Urban Design Course (IT Communication Design Lab.)	Associate Professor Masashige MOTOE	Aiming to design and implement the environment that people can show their ability each other, by developing the new way of usage of architecture and urban space, by enhancement of the communication using the various information technologies of today.
Architecture and Urban Design Course (Project Design Lab.)	Professor (Concurrent post) Toshikazu ISHIDA	The modern urbanism and architectural design have begun to show the aspect of optimization technology that combines various engineering and validity in society as a single project, beyond the traditional design work that deals with mere hardware. In this field, we aim to nurture human resources who design living environments by integrating technologies related to cities and architecture, such as energy problems.
Architecture and Urban Planning Course (History of Architecture Lab.)	Associate Professor Shunichi NOMURA	In this laboratory, we study the history of Japanese and Oriental architecture from ancient times to the pre-modern era and cultural heritage studies to preserve and restore such architecture. We study buildings' design, technique, space, and structure and the philosophies and social backgrounds that created them from various perspectives and eye to cultural relations with East Asia.
Architecture and Urban Planning Course (World Heritage Architecture Lab.)	Associate Professor Junichiro HIGAYA	Based on surveys of existing relics and readings of literature and historical materials, this laboratory undertakes the historical study of UNESCO world heritage architecture and buildings, focusing mainly on the Italian Renaissance. Moreover, the laboratory also undertakes a broad range of preservation and restoration research in addition to undertaking historical research of modern architecture and industrial heritage properties, both in Japan and overseas, that are commonly overlooked as being cultural properties.

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Architecture and Urban Planning Course (Architectural Programming for Public Facilities Lab.)	Associate Professor Haruka TSUKUDA	Architectural programming for public facilities laboratory focuses on the study of planning for living environments and various facilities in modern society. Living environments are a vessel that supports the minimum living in today's difficult society and various facilities promote many social activities. To soften our recent problems, it would be necessary to reconsider the role of them.
Architecture and Urban Planning Course (Theory for Architectural Space Lab.)	Professor Yasuaki ONODA	The relationship between space and human behavior is one of the most popular questions for architectural people. Theory for architectural space laboratory has been challenging this fundamental issue with studying the basic schema of space cognition, the history of understanding space, or the role of profession around space creation. Base on the result of the research, the laboratory participates many exploratory projects.
Architecture and Urban Planning Course (Urban and Regional Planning System Lab.)	Professor (Concurrent post) Michio UBAURA	Urban and regional planning system laboratory has been focusing on the study of urban and regional spatial planning, management and implementation system to create sustainable spatial structure using domestic and international case studies. The main research fields also cover disaster prevention planning and recovery planning from large scale disasters.
Architecture and Urban Planning Course (Urban Management Lab.)	Professor Michio UBAURA	With a view to the future decrease in the general population and increase in the aging population in Japan, this laboratory studies methods for structuring cities and residential areas that are appropriate for the times through effective strategies for utilizing existing housing and social capital stocks and methods for developing new "residency capital".
Architecture and Urban Planning Course International Research Institute of Disaster Science (Spatial Design Strategies Lab.)	Professor Tsukasa IWATA	The quality of space in architecture, cities, and regions needs the resilience to face various social changes such as disasters, population decline, and a super-aging society with a declining birthrate. For that purpose, it is necessary to utilize the local resources and traditional techniques based on the local climate. The Spatial Design Strategy Lab. conducts research on the creation of a sustainable and powerful community and the regeneration by the region itself.
Architecture and Urban Planning Course International Research Institute of Disaster Science (International Strategy for Disaster Mitigation Lab.)	Professor Osamu MURAO	Continuously monitoring the areas affected by past disasters or vulnerable districts in the world, International Strategy for Disaster Mitigation Laboratory (ISDM) aims to develop and to provide more practical and useful strategies for future disaster reduction. Current research topics in the lab. are as follows: Urban vulnerability assessment, Relationship between urban/architectural design and disaster management, Disaster response such as tsunami evacuation, Post-disaster urban recovery comparison, etc.
Sustainable Architecture and Building Science Course (Regional Environment Planning Lab.)	Professor Akashi MOCHIDA	Urban climate is influenced by regional characteristics, e.g. geographical features, land-use, sea breeze and anthropogenic heat release, etc. To propose the proper solutions for various environmental problems in various regions, this laboratory has been focusing on the following research areas: 1) Simulation methods for the analysis of microscale & mesoscale climates based on CFD modelings, 2) Clarification of regional characteristics of urban climates using the results of the climate analysis, 3) Methodology for the control and design of urban environment in accordance with the regional characteristics.

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Sustainable Architecture and Building Science Course (Sustainable Environment Creation Lab.)	Associate Professor Hikaru KOBAYASHI	To realize a healthy and comfortable living environment with less environmental burden, we are investigating and analyzing the indoor environment and energy consumption of buildings and developing highly efficient facility equipment. In this laboratory, we are also studying natural utilization technologies available onsite such as natural daylighting systems and solar thermal utilization.
Sustainable Architecture and Building Science Course (Human Environment Design Lab.)	Associate Professor Tomonobu GOTO	In order to create healthy, comfortable and productivity-enhancing built environment, the human environment design laboratory studies human physiological, psychological and behavioral responses to indoor/outdoor physical environments. Based on these studies, this laboratory also develops new techniques and methodology to control and design indoor/outdoor environment.
Sustainable Architecture and Building Science Course (Life Cycle Engineering Lab.)	Associate Professor Tomoya NISHIWAKI	For establishing a sustainable society, the sufficiently long service life of buildings is one of the essential key factors. To this aim, we work on the development of new building materials, the establishment of evaluation methods of building performance, clarification of deterioration mechanism of building materials, and so on. Based on the research of the cement-based materials from material-level to building-level, we deal with the building life cycle from the construction to the maintenance and extending service life.
Sustainable Architecture and Building Science Course (Building Rehabilitation Engineering Lab.)	Associate Professor (Concurrent post) Tomoya NISHIWAKI	Change (generally means deterioration) in building performance is unavoidable regardless of the initial high cost and/or performance. In order to cope with this deterioration permanently, we work on the development of innovative building materials and construction methods, such as concrete 3D printing, self-healing concrete, and reuse systems that are incorporated from the beginning of construction.
Structural Engineering for Architecture Course (Structural Safety System Lab.)	Professor (Concurrent post) Yoshihiro KIMURA	The laboratory investigates a variety of subjects related to the wind effects on structures and urban environment. The subjects of on-going researches are as follows: wind resistant design of structures; evaluation of wind resistant performance of structures; wind damage to structures by tornados and downbursts and its mitigation; and pedestrian-level wind environment around buildings.
Structural Engineering for Architecture Course (Performance Control System Lab.)	Professor Masaki MAEDA	Performance evaluation and structural design of building structures with safety, high-quality and sustainability. Development of new material and innovative structural system. Earthquake disaster prevention and risk analysis for reinforced concrete buildings and cities. Development of middle to high-rise timber building structures.
Structural Engineering for Architecture Course (Adaptive Design Engineering Lab.)	Associate Professor Noriyuki TAKAHASHI	To evaluate the anti-disaster performances such as seismic safety, reparability, tsunami-proof performance of new/existing/historic buildings are studied in this laboratory. And new adaptive/acceptable/affordable technologies such as digital-image-based damage investigation system are developed for enhancing the anti-disaster performances.
Structural Engineering for Architecture Course (Methodology on New Material-based Structural System Lab.)	Professor Yoshihiro KIMURA	This laboratory aims to create innovative seismic design and develop novel structural system of steel structures. Our featuring outcomes invented experimentally, numerically, and theoretically have been thereby adopted into prevailing seismic guidelines and practical structural design. The major research topics are as follows: 1) Invention of Evaluation Method of Lateral Buckling Strength of Large-span Beams, 2) Creation of Seismic Design of Braced Steel Structures, 3) Construction of Ultimate Design Method of Steel Piles and Elucidation of Dynamic Buckling Behavior of Steel Piles in Liquefied Soil, 4) Development of Mid-floor Leveled Column Base System Preventing Column Yield and Assessment of Ultimate Seismic Capacity of Steel Moment Resisting Frames with the System

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Structural Engineering for Architecture Course International Research Institute of Disaster Science (Earthquake Engineering Lab. (Ohno Lab.))	Associate Professor Susumu OHNO	Researches on seismic hazard, ground motion based on regional strong-motion observation networks, and seismic response of soil-structure systems using long-term structural monitoring are conducted. By combining these researches with the latest real-time seismic observation, information transmission, and machine learning technologies, studies on damage estimation and disaster mitigation technologies such as earthquake early warning, shake-map and earthquake damage estimation, and building structural health monitoring are conducted.
Structural Engineering for Architecture Course International Research Institute of Disaster Science (Earthquake Engineering Lab. (Ikago Lab.))	Professor Koju IKAGO	This laboratory pursues development of innovative seismic protective systems to effectively mitigate the damages in building structures caused by extreme seismic events such as long-period/long-duration and extremely large ground motions. Conventional velocity- and displacement-dependent devices such as fluid dampers and hysteretic dampers are not necessarily effective against extreme seismic events because their energy dissipation is considered to be compromised when subjected to low velocity and large displacement. Under the new concept of Displacement Control Design we advocate, we develop innovative response control devices that can achieve large energy dissipation particularly in a range of low frequency and large displacement.
Structural Engineering for Architecture Course International Research Institute of Disaster Science (Disaster Education Research and Implementation Lab.)	Professor Takeshi SATO	Is working towards construction of a resilient society, with interdisciplinary research on such as education, sociology, economics, and medicine. Supports education in schools and enlightenment in local communities for disaster risk reduction in disaster-affected area.
Structural Engineering for Architecture Course International Research Institute of Disaster Science (Disaster Culture and Archive Studies)	Associate Professor Akihiro SHIBAYAMA	This laboratory conducts "disaster reduction research" in order to build a community that can adequately respond to large-scale disasters. It collects information necessary for emergency responses, including records of past events, social network communication, earthquake-tsunami observation, health monitoring, etc. More specifically, our activities focus on estimating the damages incurred immediately after a catastrophe and provide the information required for disaster response.

Note: 1. For more detailed information, please contact the director. (Professor Akashi MOCHIDA, TEL+81-22-795-7884)