

English-based Program												
Department	Research Area	Research Instruction	Application Code		Main Supervisor	Vice Supervisor						
			Master	Doctor								
Department of Modern Mechanical Engineering	Advanced Design and Co-creation Division	Research on Mechanical Interaction Design	To innovate future mechanical structural systems, we research the system design focusing on the mechanical interaction design = "various interactions between components, machines and objects (environment etc.), mechanical systems". In particular, it covers space structural systems including deployable structures.	E02	E52	Professor	Doctor of Engineering (The University of Tokyo)	ISHIMURA, Kosei	ishimura@waseda.jp			
Department of Modern Mechanical Engineering	Advanced Design and Co-creation Division	Research on Transporters & Energy Plants Materials Science and Engineering	For improve energy efficiency and reliability of modern mechanical systems, such as automobiles, high speed trains, airplanes and electric power plants, R&D are carried as to new materials and fabricating process for these systems.	E05	E55	Professor	Doctor of Engineering (Waseda University)	YOSHIDA, Makoto	makoto-yoshida@waseda.jp			
Department of Modern Mechanical Engineering	Advanced Design and Co-creation Division	Research on Mechanical System Design	Technologies aided mechanical design, for example optimization of structural and control system and concept design process, are studied based on structural and dynamical analysis. Technologies for computer aided engineering and finite elements method are also treated from a broad view of an application for various structures including human bodies and membrane structures.	E06	E56	Professor	Doctor of Engineering (Waseda University)	MIYASHITA, Tomoyuki	tomo.miyashita@waseda.jp			
Department of Modern Mechanical Engineering	Robotics and Medical/Welfare Service Division	Research on Intelligent Machine	Research on Intelligent Robotics, Human Interface, Machine Psychology/Physiology, Intelligent Manufacturing System based on Biomechanism. 1) Human-symbiotic Robot, 2) Emergence of Mind in Mechanical Systems. 3) WABOT-HOUSE Project (Design of Structured Environment).	E07	E57	Professor	Doctor of Engineering (Waseda University)	SUGANO, Shigeki	sugano@waseda.jp			
Department of Modern Mechanical Engineering	Robotics and Medical/Welfare Service Division	Research on Mechanical Engineering in Medical Field	Analysis for the function related to circulation of blood flow in lifes, to extract the nature and characteristics of these functions by using mechanical engineering approach.	-	E59	Professor	Doctor of Engineering (Waseda University)	IWASAKI, Kiyotaka	iwasaki@waseda.jp	Associate Professor	Doctor of Engineering (Waseda University)	YAGI, Takanobu
Department of Modern Mechanical Engineering	Robotics and Medical/Welfare Service Division	Research on Biorobotics	By constructing anthropomorphic/humanoid robots that function and behave like a human, we attempt to develop a design method of a humanoid robot having human friendliness to coexist with humans naturally and symbiotically, as well as to scientifically build not only the physical model of a human but also the mental model from the engineering view point.	-	-	Professor	Doctor of Engineering (Waseda University)	TAKANISHI, Atsuo	contact@takanishi.mech.waseda.ac.jp			

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Department of Modern Mechanical Engineering	Environment and Energy Division	Research on Exergy Engineering	This area of research aims to develop environmentally conscious energy systems of mutual conversion among electric, thermal and chemical energy from the viewpoint of exergy. Specific research areas include: Energy storage system for levelizing variable renewables, CO2 Capture and Sequestration, Chemically Recuperation, Fuel Cells and Li-ion Batteries.	E12	E62	Professor	Doctor of Engineering (Waseda University)	NAKAGAKI, Takao	takao.nakagaki@waseda.jp			
Department of Modern Mechanical Engineering	Environment and Energy Division	Research on Thermal Energy Reaction Engineering	Research area is placed on the chemico-thermo fluid dynamics for the development of low emissions and high thermal efficiency internal combustion engines, catalyst and batteries for the use of automobiles.	E13	E63	Professor	Doctor of Engineering (Waseda University)	KUSAKA, Jin	j.jin.kusaka@waseda.jp			
Department of Modern Mechanical Engineering	Advanced Design and Co-creation Division	Research on Co-creative Interface Design	Designing "Being" between Human and Tools. The tools, generally technologies, used through human body can create new functions by organizing relation between the body and the tools. Designing "being" between human and tools means focusing on this organizing process, and ordering the procedure meaningfully for achieving a specific purpose. Our research aims are exploring and embodying a methodology of increasing potentiality of experiences which are how human being is involved with the world, such as human's motion, cognition, imagination, expression and communication, through the involvement of tools.	E16	E66	Professor	Doctor of Engineering (Waseda University)	UESUGI, Shigeru	wesugi@waseda.jp			
Department of Modern Mechanical Engineering	Environment and Energy Division	Research on Environment-conscious System and Machine	Research and development of energy conversion machines using an external-combustion and/or natural refrigerants. Studies on their applications to advanced distributed power generation and co-generation, and high-efficient refrigeration and air-conditioning. Study on optimum utilization of unused or renewable energy.	-	E67	Professor	Doctor of Engineering (Waseda University)	SEKIYA, Hiroshi	sekiya@waseda.jp			
Department of Modern Mechanical Engineering	Advanced Design and Co-creation Division	Research on Transporters Production Technologies	R&D of production technologies for automobile and railway cars.	-	E72	Professor	Doctor of Engineering (Waseda University)	YOSHIDA, Makoto	makoto-yoshida@waseda.jp	Associate Professor	Doctor of Engineering (The University of Tokyo)	OKANE, Toshimitsu
Department of Modern Mechanical Engineering	Robotics and Medical/Welfare Service Division	Research on Neuro Robotics	System integration design for human supportive robotics facilitating human's perception, cognition and motor functions by minimum intervention with robotics technology (RT): 1) Perception assistive rehabilitation RT. 2) RT based motor re-learning, 3) Psychophysical or Neuro imaging evaluation, 4) Embodiment interface for intelligent construction machinery and 5) Engineering based emergency medicine.	E24	E74	Professor	Doctor of Engineering (Waseda University)	IWATA, Hiroyasu	jubi@waseda.jp			

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Department of Modern Mechanical Engineering	Robotics and Medical/Welfare Service Division	Research on Bio-mechanical System	Research on Mechanical System Design based on Bio-mechanism		-	E75	Professor	Doctor of Engineering (Waseda University)	SUGANO, Shigeki	sugano@waseda.jp	Associate Professor	Doctor of Philosophy (Interdisciplinary Information Studies) (The University of Tokyo)	TAMAKI, Emi
Department of Modern Mechanical Engineering	Robotics and Medical/Welfare Service Division	Research on Field Robotics	R&D of Field Robots operated in Natural Environment		-	E76	Professor	Doctor of Engineering (Waseda University)	SUGANO, Shigeki	sugano@waseda.jp	Professor	Doctor of Engineering (Waseda University) Doctor of Engineering (Tokyo Institute of Technology)	MIYASHITA, Tomoyuki YOKOI, Kazuhiro

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Department of Modern Mechanical Engineering	Robotics and Medical/Welfare Service Division	Research on Human-robot Interface	Research on Intelligent Interface for Human-Robot Communication	-	E77	Professor	Doctor of Engineering (Waseda University)	SUGANO, Shigeki	sugano@waseda.jp	Professor Professor Associate Professor	Doctor of Engineering (Waseda University) Doctor of Engineering (Waseda University) Ph.D. University of Sheffield	UESUGI, Shigeru IWATA, Hiroyasu SCHMITZ, Alexander
Department of Modern Mechanical Engineering	Robotics and Medical/Welfare Service Division	Research on Image Engineering	Algorithms that recognize and understand 3D scenes containing moving objects by analyzing the video sequences and/or still images acquired by video cameras are researched. In particular, we focus on research on computer vision technologies that can contribute to the actualization of robot visions and autonomous medical systems.	E28	E78	Professor	Doctor of Engineering (The University of Tokyo)	OHYA, Jun	ohya@waseda.jp			
Department of Modern Mechanical Engineering	Advanced Design and Co-creation Division	Research on Technology on Micro/Nano Fabrication	Technologies on micro/nano fabrication in the field of cutting-edge area.	E29	E79	Professor	Doctor of Engineering (Waseda University)	UMEZU, Shinjiro	umeshin@waseda.jp			
Department of Modern Mechanical Engineering	Environment and Energy Division	Research on Applied Mechanics of Fluid-Structure Interaction	We focus on computational engineering analysis with advanced flow simulation and modeling methods developed by us. We focus on the advanced research with immediate relevance - research that brings solution and analysis to real-world problems and makes impact on our lives.	E30	E80	Professor	Doctor of Science (Tokyo Institute of Technology)	TAKIZAWA, Kenji	kenji.takizawa@waseda.jp			

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Department of Modern Mechanical Engineering	Advanced Design and Co-creation Division	Research on Sophisticated Heat Protection	Velocity of airframe is over 10 km/s at atmospheric re-entry. Due to detached shock wave generated at front of airframe, airframe is exposed to cruel aerodynamic heating. We are now studying sophisticated heat protection system for protection of the aerodynamic heating.	E32	E82	Professor	Doctor of Engineering (Waseda University)	UMEZU, Shinjiro	umeshin@waseda.jp	Professor	Doctor of Engineering (Tohoku University)	SUZUKI, Toshiyuki
Department of Modern Mechanical Engineering	Robotics and Medical/Welfare Service Division	Research on Adaptive Robotics	Adaptation is an important function of organisms, such as animals and plants, that helps them have better life in its environment. The purpose of this research is to develop methodologies to realize adaptations of robots. System integration, mechanical design, and control are key technologies for that. Not only technological developments but also experimental and field studies are targets of this research. Studying related research fields, such as biology and psychology, is an important approach. In addition to those, social implementations of research outputs are in a focus of this research.	E33	E83	Professor	Doctor of Engineering (Waseda University)	ISHII, Hiroyuki	hiro.ishii@waseda.jp			
Department of Modern Mechanical Engineering	Environment and Energy Division	Research on Fluid Mechanics of Computational Analysis	The research is on computational analysis of a wide range of challenging engineering problems where fluid mechanics is the core part of the physical problem. The research includes identification of the analysis target and challenges, proper mathematical modeling, effective interpretation of the computed results, and the extraction of valuable engineering information and data. We focus not only on the fluid mechanics aspects of the problem, but also on innovating the methods needed to address the computational challenges faced.	E34	E84	Professor	Doctor of Engineering (California Institute of Technology)	TEZDUYAR, Tayfun	tetezduyar@aoni.waseda.jp	Professor	Doctor of Science (Tokyo Institute of Technology)	TAKIZAWA, Kenji
Department of Modern Mechanical Engineering	Environment and Energy Division	Research on Systems Mechanics	In this laboratory, we construct a mathematical model of a complex system that has never been challenged by combining various mechanical laws, and ultimately, research aiming at finishing it into the form of software that can be utilized in industry and society. Current theme is estimating the physical condition of the driver, which is deeply related to the safety of the car. Specifically, we will conduct mathematical models useful for driver's physical condition prediction using coefficients determined from big data analysis of measured biological signals.	E35	-	Professor	Doctor of Engineering (Waseda University)	KANEKO, Shigehiko	shigehiko.kaneko@aoni.waseda.jp	Professor	Doctor of Engineering (Waseda University)	KUSAKA, Jin

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Department of Modern Mechanical Engineering	Advanced Design and Co-creation Division	Research on Mechanical Design Generation	By generating the knowledge or making effective use of stored knowledge among many fields concerning the transportation and its structure and mechanism of infrastructure on ground, water, in the air and space, the development of the design methodology to confirm the feasibility is treated proposing the structural concept of building of novel infrastructure.	E37	-	Professor	Doctor of Engineering (Waseda University)	MIYASHITA, Tomoyuki	tomo.miyashita@waseda.jp	Professor	Doctor of Engineering (The University of Tokyo)	HIGUCHI Ken
Department of Modern Mechanical Engineering	Advanced Design and Co-creation Division	Research on Creative Structures and Mechanisms	To realize novel structures with advanced functions such as ultra-high shape stability and extreme environmental resistance, we research the creative structures and mechanisms structures. Furthermore, the construction method of space structural system on orbit and the mechanism for landing on other celestial bodies are investigated.	E38	-	Professor	Doctor of Engineering (The University of Tokyo)	ISHIMURA, Kosei	ishimura@waseda.jp	Professor	Doctor of Engineering (Waseda University)	MIYASHITA, Tomoyuki
Department of Modern Mechanical Engineering	Environment and Energy Division	Research on Automotive Powertrain	In this research instruction, we will investigate the calibration and validation methodologies for automotive powertrains. For this reason, not only the internal combustion engine and the catalyst, but also the energy flow of the components such as the battery, the inverter, and the e-motor are clarified, the components are modeled, and a vehicle model that combines them is created. In addition, we will investigate in detail the influencing factors of various operating parameters on the power performance and fuel efficiency of the powertrain, and we will examine the optimal control method for operating parameters. Furthermore, the control method examined on the desk in this way is validated in an actual machine, and a highly accurate prediction model is constructed while correcting the model.	E39	-	Professor	Doctor of Engineering (Waseda University)	KUSAKA, Jin	jin.kusaka@waseda.jp	Professor	Doctor of Engineering	NOYORI Takahiro
Department of Modern Mechanical Engineering	Environment and Energy Division	Research on Energy System Mechanics	We will work on research themes that aim to make technological contributions to realize energy systems, which are in harmony with the dramatically changing society and environment. Specifically, we will develop simulations and experimental studies on mechanical systems related to energy conversion using mathematical models based on mechanical laws. In detail, through the construction and application of mathematical models with physical meanings that are accepted in the information society, we will tackle various engineering issues and work to solve them.	E40	E90	Associate Professor	Doctor of Engineering (Tsukuba Univ.)	Akane Uemichi	uemichi@waseda.jp	Professor	Doctor of Engineering (Waseda University)	KUSAKA, Jin
Department of Modern Mechanical Engineering	Environment and Energy Division	Research on measurement techniques in thermofluid dynamics	"Measurement" is the driving force of development of science and technology, and many new scientific discoveries have been made through the most advanced measurement technique at the time. The development of measurement technique is essential for deep understanding of complex thermofluid phenomena. In this research field, we develop intelligent measurement methods, which will enable us to detect physical quantities and latent factors that were difficult to detect in the past, based on the coalition between measurement technologies and informatics and statistical mathematics sciences.	E41	E91	Associate Professor	Doctor of Engineering (Nagoya University)	MATSUDA, Yu	y.matsuda@waseda.jp			