

ESEP-UC 2025 Host Laboratories (June 19 - July 30, 2025)

	Department	Host Professor	Research Topic & Research Description	Special academic conditions required for research				Lab website
				1) Prerequisite knowledge and/or special skills and level of proficiency	2) Required academic background	3) Academic or research project experiences beneficial during selection process	4) Other conditions	
1	Civil Engineering	Professor KATO Hironori	Energy transition and international cooperation and competition in Asia. Focus on the role of the impact of international	One or more of the following: energy and development, impact assesment, multi criteria decision analysis	Energy studies, both from natural and social science backgrounds	Experience with international coopreation and energy transition in Asia would be beneficial.		http://intl.civil.t.u-tokyo.ac.jp/ https://www.facebook.com/IPLabUTokyo
2	Urban Engineering	Project Professor KITAJIMA Masaaki	Wastewater-based epidemiology is a public health management tool used to monitor pathogens, including viruses and antimicrobial-resistant bacteria, excreted by infected individuals in sewage treatment plants. The Laboratory of International Wastewater-based Epidemiology, established in March 2024, aims not only to lead the development of this emerging academic field but also to contribute to building a society resilient to infectious diseases through the implementation of wastewater-based epidemiology studies both domestically and internationally.	Basic molecular microbiology knowledge would be an advantage. A background in public health, clinical health, or data science is also highly valued.	Environmental virology, public health, clinical health, data science	Some experience beyond classroom and textbooks would be beneficial (not mandatory).		https://recwet.t.u-tokyo.ac.jp/wbe/en/index.html
3	Mechanical Engineering	Professor YANAGIMOTO Jun	Advance knowledge of established forming technologies for engineering materials such as prediction and control of isotropicity in sheet metal rolling. Develop novel forming technologies for engineering materials such as warm forming of Carbon Fibre Reinforced Polymer. Advance knowledge of established engineering materials such as strain-rate- and temperature-dependence of phase transformation kinetics in High Strength Steel by material genome characterisation, correlating processing conditions to microstructural evolution and to mechanical properties. Develop novel engineering materials such as hot extruded aluminum-graphene alloy. Develop novel engineering structures such as aluminium alloy-Carbon Fibre Reinforced Polymer sandwich structure with dome-shaped core.	Any of the following: New material design, structural design, thermo-mechanical processing, material characterisation, mechanical testing, Finite Element Method, regression analysis	Mechanical Engineering, Materials Engineering or Aerospace Engineering	Design and execution of laboratory experiments using thermo-mechanical testing machines, servo-mechanical press, tensile testing machine with Digital Image Correlation for strain measurement, multi-purpose mechanical testing machine, autoclave, Scanning Electron Microscope equipped with Energy-Dispersive X-Ray Spectroscopy and Electron Backscattered Diffraction, Finite Element Method via Abaqus CAE and / or mathematical models	Capable of generating original research ideas, organising research schedule, undertaking research in a safe and ethical manner, presenting research results in lab seminars	https://www.cem.t.u-tokyo.ac.jp/?lang=en

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4	Mechanical Engineering	Professor SHIOMI Junichiro	Thermoelectric material/device, droplet wetting, or materials informatics (material x data)	Basic skills in programming or experience in experiments	One of the following subject; Heat transfer, Fluid mechanics, Solid-state physics, Materials science, or Data science	Any problem solving experience using computation or experiments		http://www.phonon.t.u-tokyo.ac.jp/?lang=en
5	Mechanical Engineering	Professor VENTURE Gentiane	<p>(1) Tend to my plants. Objective: This project aims to develop an expressive control system for a small manipulator robot specifically designed to assist with the care and maintenance of interior plants. The robot will autonomously perform tasks like watering, pruning, and repositioning plants while using expressive movements to communicate its actions to users in an intuitive and aesthetically pleasing manner.</p> <p>(2) Walk and talk with me. Objective: Using LLM to converse, visual servoing and force control, this project aims at further developing the capability of the Pepper robot to go for a walk with its user, have a conversation and carry-on mundane tasks.</p> <p>(3) Follow me with style. Objective: Using LLM to converse, visual servoing and expressive movements, this research projects aims at creating a controller for a mobile robot to follow its user or go where asked to while reproducing its user's moving style.</p>	All projects require skills in: - proficiency in programming in python, C, C++ or Matlab. - basic robotics skills or at least linear algebra and matrix calculus skills - English communication	None specifically	Any activity involving programming robots, IoT etc... such as ROS, Arduino, Raspberry Pi... will be a tremendous help.		www.gvlab.jp https://www.facebook.com/GVentureLab https://www.instagram.com/gvlab_robotics/ https://www.youtube.com/user/GVLaboratory
6	Systems Innovation	Professor TAKAHASHI Jun Lecturer WAN Yi	Advanced Composite Material Technology for Future Society - CFRTP for the Future Transportation Society - Innovative Simulation Technology for New Services - Hybrid Materials for Improving Social Resilience http://j-t.o.oo7.jp/research-e.html	Mechanics of materials Strength of materials	Mechanics of materials Strength of materials	Composite material Carbon fiber reinforced plastics		http://j-t.o.oo7.jp/index-e.html https://wanlab-ut.com/en/

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7	Aeronautics and Astronautics	Professor IMAMURA Taro	Aerodynamic simulation around an airfoil using Computational Fluid Dynamics: We will provide you our in-house CFD program called UTCart for research purpose. The participant will be able to use the code, and analyse the flow field including the compressibility effect.	Windows Microsoft Office, Programming experience (python, if possible)	Fluid dynamics, Aircraft Dynamics	Any project related to aircraft designing would be beneficial. Especially, CATIA user is welcome.		http://park.itc.u-tokyo.ac.jp/rinoielab/english/index.html
8	Aeronautics and Astronautics	Associate Professor HIGUCHI Ryo	Structural Analysis of Aeronautical Composite Materials: This research involves the modeling of the material behavior of composite materials for aeronautical applications. The participant will use our in-house FEM program or commercial FEM software to analyze material behaviors that happen in the composite materials under mechanical and/or thermal loadings.	Programming experience (Python, Fortran, C, etc.)	Basic knowledge of Mechanics of Material			http://www.aastr.t.u-tokyo.ac.jp/e_index.html
9	Information and Communication Engineering	Professor KAWAHARA Yoshihiro	<p>Research Topic: Innovative Applications in IoT, Sensing, Wireless Power Transmission, and Human-Computer Interaction</p> <p>Research Description: Our research lab is dedicated to developing innovative applications that can positively impact society by leveraging cutting-edge technologies in IoT, sensing, wireless power transmission, and human-computer interaction. We focus particularly on interactive devices within the Human-Computer Interaction field, aiming to enhance the ways people interact with technology in their everyday lives. Our work integrates advanced AI and deep learning techniques to understand real-world environments, alongside expertise in signal processing, wireless power transmission, electrical circuits, digital fabrication, and robotics. We prioritize a collaborative atmosphere and actively seek talented, open-minded individuals who share our commitment to high ideals and pioneering research.</p>	Practical computer programming skills are a must for all lab members. Additionally, experience in signal processing, electrical circuits, and robotics is highly welcomed.	A background in one of the following fields is required: computer science, information science, electrical engineering, or robotics.	Those who can clearly specify what they want to work on after reviewing the published papers and YouTube content on our website will have a higher chance of being a good match.		https://www.akg.t.u-tokyo.ac.jp/ https://www.youtube.com/channel/UCadwOCbDMAh1qd1tK96ubRQ
10	Electrical and Electronic Engineering	Associate Professor ANH Le Duc	Investigate transport and magnetic properties of ferromagnetic materials grown by molecular beam epitaxy on semiconductor substrates. The intern student will also join and observe the crystal growth process.	Basic knowledge on solid state physics, and good communication skills in either English or Japanese are required.	Students with background of electrical engineering, material engineering or physics are preferable.	Not specifically required		https://anh-lab.com/

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11	Materials Engineering	Associate Professor MATSUURA Hiroyuki	<p>1) Physical chemistry of non-metallic particle formation during solidification of steel: Experimental research to elucidate the precipitation mechanism of compounds and behavior of dissolved impurities in molten iron</p> <p>2) Experimental study of lab-scale Vacuum Arc Remelting (VAR) process to evaluate its refining performance</p>	Interest for pyrometallurgy Interest for conducting lab-scale experiments Basic knowledge of chemistry	Interest for chemical thermodynamics, kinetics, or transport phenomena and fundamental knowledge of chemistry	Better for having experiences of chemical analyses and use of SEM (not mandatory)		http://www.pyro.t.u-tokyo.ac.jp/result/
12	Chemical System Engineering	Professor TAKANABE Kazuhiro	<p>Electrocatalysis for energy conversion</p> <p>Investigation on developing electrocatalyst materials will be conducted. The works involve practical experiments in laboratory, related to materials synthesis, characterization, and catalytic testings.</p>	Basic knowledge in the field of chemistry, chemical engineering, and/or materials science. Safety training is required before entering the lab. The chemical lab skill and knowledge is preferred.	Chemistry; Chemical Engineering; Materials Science.	Fundamental knowledge of chemistry, chemical engineering, and materials science.		https://www.catec.t.u-tokyo.ac.jp/
13	Bioengineering/ Precision Engineering	Associate Professor NAKAGAWA Keiichi	<p>1) Ultrafast imaging: you will capture the electron and phonon dynamics in picosecond timescales to analyze light-matter interaction during laser processing.</p> <p>2) Biophotonics: you will develop a new method to produce acoustic waves inside the body to manipulate the photons' behavior for optical biotechnologies.</p> <p>3) Biophysics: you will investigate the interactions between physical energies (photon and phonon) and biological cells/tissues to control the functions of our body.</p>	None	Knowledge of Bioengineering and Optical Engineering is advantageous but not mandatory at the time of application. Once selected, I will recommend a specific field of study tailored to the student's interests and background and provide relevant study materials.	None		https://sites.google.com/view/nakagawagroup/ http://www.bmpe.t.u-tokyo.ac.jp/en/index.html
14	Bioengineering/ Systems Innovation	Associate Professor SHIMAZOE Kenji	<p>Radiation Detection</p> <p>Medical Imaging</p> <p>Nuclear medicine</p> <p>Medical Physics</p>	Programming	One of the followings. Physics, Electrical Engineering, Computation			https://sites.google.com/view/utokyoshimazoelaboratory-en?pli=1

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15	Bioengineering/ Materials Engineering	Lecturer KATASHIMA Takuya	<p>Soft matter, including polymers, is found in many of the foods, cosmetics, and other products that surround us. Soft matter exhibits unique properties that are intermediate between solid (elasticity) and liquid (viscosity). Because our biological tissues exhibit similar intermediate properties, the design of biomaterials for contact with our body requires an understanding and control of the complex deformation and flow behavior of materials. The discipline that discusses the flow and deformation of materials is called "rheology." On the other hand, the rheological properties of materials are strongly correlated with the molecular dynamics inside the material.</p> <p>The major objective of our laboratory is to construct and develop a discipline that precisely designs materials to match human sensibility from the molecular level via rheology (Molecular psychorheology). To this purpose, we are establishing quantitative evaluation methods for sensibility, and developing techniques to elucidate and control the correlation between rheology and molecular dynamics, with the aim of freely controlling rheology.</p>	English: fluent	material science (soft matter science and rheology are better)	none in particular		https://rheo.tokyo/en/