ESEP-G 2025 List of Host Laboratories (June 24 - August 1, 2025)

20-Nov-24

No.	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	Low carbon transportation and mobility in developing countries and emerging economies. Focus on knowledge management tools for innovative policy making and education/research. This includes: conduct case studies, development of data & policy repository, and desigon of participatory workshop	One or more of the following: urban planning, energy systems analysis, econometrics, impact assessment, internationalization and business strategy, participatory planning	Civil engineering, but also others with background on transportation, urban development, and energy studies	Experience with international development projects would be beneficial.		http://intl.civil.t.u-tokyo.ac.jp/ https://www.facebook.com/IPLabUTokyo
2	Civil Engineering	Professor NAGAYAMA Tomonori Associate Professor SU Di	Bridge Engineering, Structural Dynamics *Please enter "Associate Professor SU Di" in the 'Desired Lab information' of the application system."	Structural mechanics and dynamics, basic programming knowledge	Civil Engineering			http://bridge.t.u-tokyo.ac.jp/index_e.html
3	Civil Engineering	Project Associate Professor WANG Hailong	Topic: Suction of unsaturated sandy soils Description: This topic focuses on the measurement of very small suction of unsaturated sandy soil using a advanced filter technique. Suction in the soils is very important to control unsaturated soil strength of soils, which helps to reduce the possibility of ground liquefaction, slope failure, water seepage etc. We will use a new technique to measure it and see how it works on the sandy materials.	Knew soil mechanics, geotechnical engineering or other related fields, such as engineering geology, earthquake engineering, or tunnel engineering.		Preferred if students have experiences on manufacturing or experimental works		https://geotle.t.u-tokyo.ac.jp/ https://sites.google.com/view/hailongwang/introduction?authuser=0
4	Architecture	Professor NOGUCHI Takafumi	The followings will be implemented for the research on CO2 capture by concrete. 1) Experimental works of acceleration of concrete carbonation, i.e. gas-solid carbonation and wet carbonation 2) Chemical analyses of carbonated phases in concrete using X-ray diffraction, thermogravimetric analysis, microscopy observation, etc. 3) Physical analyses of carbonated concrete using X-ray computed tomography, nitrogen absorption, water vapor absorption, etc. 4) Experimental works on mechanical properties such as strength and modulus of elasticity of carbonated concrete	It is desirable that the applicant has various knowledge of cement and concrete that are becoming a savior of curbing global warming. Carbonation process in concrete was a phenomenon to be suppressed so far but it should be accelerated unless the carbonation leads to corrosion of steel in concrete. Applicants should have knowledge of CO2 emission and resource circulation in cement and concrete field, carbonation mechanism of concrete and required performance of concrete. Applicants should have an experience of experimental works using cement and concrete.	None	It is preferred that students have an experience to make cement mortar or cement concrete.		http://bme.t.u-tokyo.ac.jp/en https://moonshot-c4s.jp/en/

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5	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 lab skills, such as DNA/RNA extraction, reverse transcription, PCR, qPCR, digital PCR, next-generation sequencing would be an advantage. A background in environmental engineering, environmental microbiology, public health, molecular biology, bioinformatics, data mining, or modeling is also highly valued. If you come from a different field but are eager to learn and broaden your research expertise, we warmly encourage you to apply.	Environmental virology, environmental microbiology, bioinformatics, public health, data mining/modeling	Experience of participation in research project would be beneficial.	Graduate students only	https://recwet.t.u-tokyo.ac.jp/wbe/en/index.html
6	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.		https://www.phonon.t.u-tokyo.ac.jp/?lang=en
7	Mechanical Engineering	Professor VENTURE Gentiane	(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. (2) Walk and talk with me. Objective: Using LLM to converse, visual servoing and force control, this project aims at further deveopling the capability of the Pepper robot to go for a walk with its user, have a conversation and carry-on mundane tasks. (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.	All projects require skills in: - profiency 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

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8	Mechanical Engineering	Lecturer MOUTERDE Timothée	Our lab is specialized in fluid mechanics and in particular in wetting phenomena. We engineer surfaces, for example with surface nanostructures, to modify the behavior of the fluids in contact. The student that will join will do mostly experiments to understand the physics of non-wetting effects (superhydrophobic, leidenfrost, etc). The precise topic will be determined in advance after acceptance.	Nothing specific but experimental knowledge for fluids	Physics, fluids mechanics	Anything related to fluids or experimental physics would be great but it is not mandatory.	Undergraduate students only (We are very happy to welcome undergraduate students who wish to pursue in the University of Tokyo for a Master degree.)	https://mouterde-lab.com
9	Systems Innovation	Professor KOSHIZUKA Seiichi	Trainees will participate in the research activities in the ongoing projects in Koshizuka- Shibata Laboratory. The projects are of computer simulation and computer graphics using particle methods: for example, fluid dynamics, solid dynamics, rain water infiltration in a car, droplet behavior, mixing process, flooding, tsunami, etc.	Experience of computer programming using C or other languages. Knowledge of basics of fluid dynamics or solid dynamics.				http://mps.q.t.u-tokyo.ac.jp/lab/
10	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 *Please enter "Lecturer WAN Yi" in the 'Desired Lab information' of the application system."	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/
11	Systems Innovation	Associate Professor KANNO Taro	1) Simulation/experimental study or data analysis on team cognitive behavior (e.g. communication analysis; exploring performance indicators; team behavior tracking; multimodal data analysis). 2) Studies related to hospital disaster training and management (e.g. analysis of exercise records, computer simulation of mass casualty incidents, software development). 3) Others (if requested, related to human-centered systems design, operation, and management).	Intermediate JAVA and/or Python programming skill for the topics related to simulation and data analysis	Preferable but not limited to human factors, cognitive engineering, resilience engineering, industrial engineering and management			http://www.tkanno.net/

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12	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. Expecially, CATIA user is welcome.		http://park.itc.u-tokyo.ac.jp/rinoielab/english/index.html
13	Aeronautics and Astronautics	Professor YOKOZEKI Tomohiro	Fabrication and Testing of Aeronautical Functional Materials Multifunctional polymer composites are widely developed in aerospace fields. This research involves the manufacturing of functional materials for aeronautical application and the testing and analysis of the fabricated materials.	Basic knowledge of Material Science and Mechanics				http://www.aastr.t.u-tokyo.ac.jp/e_index.html
14	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
15	Electrical Engineering & Information Systems	Professor KAWAHARA Yoshihiro	Research Topic: Innovative Applications in IoT, Sensing, Wireless Power Transmission, and Human-Computer Interaction 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.	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

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16	Electrical Engineering & Information Systems	Professor TANEMURA Takuo	Integrated photonics and nanophotonic devices for optical commumication, sensing, and computing	Basic skills in programming using Matlab or Python	Basic knowledges about optics, electrical engineering, and/or machine learning	None		https://www.tlab.t.u-tokyo.ac.jp/
17	Electrical Engineering & Information Systems	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/
18	Materials Engineering	Professor WATANABE Satoshi	Molecular dynamics simulations using interatomic potentials constructed via machine-learning: This project aims to understand properties related to atomic processes such as diffusion and their relationship with features of atomic structures through molecular dynamics simulations with interatomic potentials constructed via machine-learning (specifically, neural networks). Specific tasks may include the assessment and improvement of interatomic potentials, as well as the analysis of simulation results using advanced methods such as persistent homology and Voronoi tessellation.	None	Basic knowledge on solid state physics or materials science. Specifically, on atom dynamics in solids.	Molecular dynamics simulation; Python programming; machine learning; numerial analysis		http://cello.t.u-tokyo.ac.jp/index.php?id=7
19	Materials Engineering	Associate Professor MATSUURA Hiroyuki	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 2) Experimental study of lab-scale Vacuum Arc Remelting (VAR) process to evaluate its refining performance	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/
20	Chemical System Engineering	Professor TAKANABE Kazuhiro	Electrocatalysis for energy conversion Investigation on developing electrocatalyst materials will be conducted. The works involve practical experiments in laboratory, related to materials synthesis, characterization, and catalytic testings.	Basic knowledge in the field of chemistry, chemical engineering, and/or materials science. Safetry 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/

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21	Bioengineering/ Materials Engineering	Associate Professor CABRAL Horacio	Development of Polymeric Nanocarriers for Targeted Gene Editing Applications This research aims to develop polymeric nanocarriers for targeted delivery of gene-editing tools. The primary goal is to design nanocarriers capable of encapsulating and delivering CRISPR/Cas9 components to target cells, facilitating precise gene editing. Over the period, the project will explore the synthesis, functionalization, and characterization of polymeric nanocarriers, focusing on PEG-based systems. The student will gain hands-on experience in nanoparticle formulation, functionalization with targeting ligands, and optimization for high gene-editing tool encapsulation efficiency and controlled release. The research will also involve testing the developed nanocarriers in vitro, using relevant cell lines to assess their gene-editing efficiency. These experiments will include cellular uptake studies, followed by an evaluation of gene-editing outcomes using molecular biology techniques such as PCR and fluorescence assays. By the end of the project, the student will have contributed to the development of polymeric nanocarriers that can be adapted for gene editing applications, with potential implications for therapeutic development in areas like cancer treatment and genetic disorders.	Basic proficiency in molecular biology, nanoparticle formulation, cell culture, and data analysis. Familiarity with gene-editing/mRNA delivery and experience with laboratory techniques like PCR, DLS, and fluorescence microscopy.	A background in materials engineering, chemical engineering biotechnology, biomedical engineering, pharmacy, chemistry, or a related life sciences field	Prior experience in nanotechnology, drug delivery systems, molecular biology techniques, or gene editing projects will be advantageous. Hands-on experience in nanoparticle synthesis, cell culture, or biomaterial development would also be highly beneficial during the selection process.		https://bmc.t.u-tokyo.ac.jp https://x.com/Cabral_Lab
22	Bioengineering/ Precision Engineering	Associate Professor NAKAGAWA Keiichi	1) Ultrafast imaging: you will capture the electron and phonon dynamics in picosecond timescales to analyze light-matter interaction during laser processing. 2) Biophotonics: you will develop a new method to produce acoustic waves inside the body to manipulate the photons' behavior for optical biotechnologies. 3) Biophysics: you will investigate the interactions between physical energies (photon and phonon) and biological cells/tissues to control the functions of our body.	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
23	Bioengineering/ Systems Innovation	Associate Professor SHIMAZOE Kenji	Radiation Detection Medical Imaging Nuclear medicine Medical Physics	Programming	One of the followings. Physics, Electrical Engineering, Computation	Programming, Circuit design	Graduate students only	https://sites.google.com/view/utokyoshimazoelaboratory-en?pli=1

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24	Bioengineering/ Materials Engineering	Lecturer KATASHIMA Takuya	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. 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.	English: fluent	material science (soft matter science and rheology are better)	none in particular		https://rheo.tokyo/en/