

ESEP-UC 2024 HOST LABORATORIES (June 20 - July 31, 2024)

	Department	Host Professor	Research Topic & Research Description	Special academic conditions required for research				Campus	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	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	Hongo	https://www.cem.t.u-tokyo.ac.jp/?lang=en
2	Mechanical Engineering	Professor DAIGUJI Hirofumi	We work on energy and transport phenomena. We are aiming to advance diverse energy technologies for energy-saving systems by scrutinizing physical phenomena such as chemical reactions, phase changes and micro/nanoscale heat and mass transfer.	None	Basic courses in mechanical engineering such as thermodynamics and fluid mechanics	Project experience is not required.		Hongo	http://www.thml.t.u-tokyo.ac.jp/en/index.html
3	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.		Hongo	http://www.phonon.t.u-tokyo.ac.jp/?lang=en
4	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		Hongo	http://j-t.o.oo7.jp/index-e.html

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5	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		Hongo	http://park.itc.u-tokyo.ac.jp/rinoielab/english/index.html
6	Aeronautics and Astronautics	Associate Professor YOKOZEKI Tomohiro	Additive manufacturing: Effect of printing parameters on mechanical properties Printing parameters including printing pass have significant effect on the quality and properties of additively manufactured materials. This research focuses on how the printing pass influences the mechanical properties, and is comprised of manufacturing of specimens and experimental characterization.					Hongo	http://www.aastr.t.u-tokyo.ac.jp/e_index.html
7	Electrical and Electronic Engineering	Professor NAKANO Yoshiaki	Semiconductor optoelectronic materials, devices, and circuits Description: Compound semiconductor material and device technologies for semiconductor lasers, optical modulators/switches, photonic integrated circuits, high efficiency solar cells, and solar fuels are studied.	None	Basic study on optics and semiconductor physics	None		Hongo / Komaba	http://www.ee.t.u-tokyo.ac.jp/~nakano/lab/e_index.html
8	Materials Engineering	Associate Professor EJIMA Hirotaka	Bioinspired Polymeric Materials (Bioinspired Underwater Adhesives, Interface Engineering using Metal-Phenolic Networks, etc.)	The basic knowledge on one of the following; materials science, chemistry and biology.	Not strictly required but better to have materials science, chemistry or biology background.	None		Hongo	http://biomacro.t.u-tokyo.ac.jp/indexen.html
9	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)		Hongo	http://www.pyro.t.u-tokyo.ac.jp/result/

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10	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. 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.		Hongo	https://www.catec.t.u-tokyo.ac.jp/
11	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		Hongo	https://sites.google.com/view/nakagawagroup/ http://www.bmpe.t.u-tokyo.ac.jp/en/index.html