ESEP-INDIA 2023 List of Host Laboratories (May 15 - July 14, 2023)

No.	Department	Title	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	Online		
1	Mechanical Engineering	Professor	SHIOMI Junichiro	Thermoelectric material/device, droplet wetting, or materials informatics (material x data)	Basic skills in programming or experience in experiments of heat transfer/fluid dynamics.	Mechanical engineering, physics, Materials science, or Data science.	Any problem solving experience using computation or experiments.		No	Hongo	http://www.phonon.t.u-tokyo.ac.jp/?lang=en
2	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	No	Hongo	https://www.cem.t.u-tokyo.ac.jp/?lang=en
3	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.		Available	Hongo	http://www.thml.t.u-tokyo.ac.jp/en/index.html
4	Systems Innovation	Professor/ Lecturer	TAKAHASHI Jun/ 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 *When you choose this laboratory on T-cens, please choose "WAN Yi" for supervisor.	Mechanics of materials Strength of materials	Mechanics of materials Strength of materials	Composite material Carbon fiber reinforced plastics		Available	Hongo	http://j-t.o.oo7.jp/index-e.html

5	Electrical Engineering & Information Systems	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		No	Hongo / Komaba	http://www.ee.t.u-tokyo.ac.jp/~nakano/lab/e_index.html
6	Materials Engineering	Professor	WATANABE Satoshi	Molecular dynamics simulations using interatomic potentials constructed via machine-learning: This project aims at understanding atomic processes such as diffution and crystallization by molecular dynamics simulations with interatomic potentials constructed via machine-learning (specifically, neural network). Specific tasks may include assesment and improvement of interatomic potentials, and analysis of simulation results using advanced methodology such as persistent homology.	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		Available	Hongo	http://cello.t.u-tokyo.ac.jp/index.php?id=7
7	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) Development of novel pyrometallurgical process for zinc: Electrochemical approach for purification of molten ZnCl2	Interest and basic knowledge for pyrometallurgy Interest for conducting lab-scale experiments	Interest and fundamental knowledge for chemical thermodynamics and electrochemistry	Better for having experiences of chemical analyses and use of SEM (not mandatory)		No	Hongo	http://www.pyro.t.u-tokyo.ac.jp/result/
8	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		No	Hongo	https://www.catec.t.u-tokyo.ac.jp/