

## . Mechanical Engineering Course

No.	1
Department	Mechanical and Systems Engineering
Lab. name	Structural Materials Engineering Lab.
Staff	Professor Mitsuhiro OKAYASU Associate Professor Yoshito TAKEMOTO Assistant Professor Yoon-Seok LEE
URL	<a href="http://kizai9.mech.okayama-u.ac.jp/index_e.html">http://kizai9.mech.okayama-u.ac.jp/index_e.html</a>
Theme title	Material properties of engineering materials
Theme description and/or Additional info.	The purpose of our researches is to propose various engineering materials with high reliability, including the metals, ceramics, composites and biomaterials. To make the engineering materials, the microstructural controls have been performed experimentally and numerically. Moreover, applied research and basic research have been executed to develop the engineering materials via our original technologies.
Requirements	Basic knowledges on “Materials Science”, “Material Strength Dynamics” and “Mechanical Design”

No.	2
Department	Advanced Mechanics
Lab. name	Applied Solid Mechanics
Staff	Professor: Naoya TADA Associate professor: Takeshi UEMORI Assistant professor: Toshiya NAKATA
URL	<a href="http://solid.mech.okayama-u.ac.jp/">http://solid.mech.okayama-u.ac.jp/</a>
Theme title	Experiments and analyses for evaluation of material’s deformation, damage, and strength
Theme description and/or Additional info.	We are researching on the mechanical behavior and damage of various materials for industrial products including automobiles, airplanes, electric power plants, electric devices, etc.
Requirements	Basic knowledge on “Materials”.

No.	3
Department	Mechanical and Systems Engineering
Lab. name	Machine Design and Tribology
Staff	Prof. Masahiro FUJII Associate Prof. Hiroshi KINOSHITA Assistant Prof. Yuya OMIYA
URL	<a href="http://mdws1.mech.okayama-u.ac.jp/">http://mdws1.mech.okayama-u.ac.jp/</a>
Theme title	Application of high functional coatings and nanocarbons to machine elements
Theme description and/or Additional info.	Carbon coatings are currently used in a wide variety of industrial fields because of their properties such as high hardness, high wear resistance, and low friction. In this study, we evaluate the tribological performance of coatings and nanocarbons in order to apply them to practical machine elements. An applicant is required to attend at the lab's regular meetings and to report a progress of the project.
Requirements	Basic knowledge on "machine elements; especially gears and bearings"

No.	4
Department	Mechanical and Systems Engineering
Lab. name	Nontraditional Machining Lab.
Staff	Professor Akira OKADA Associate Professor Yasuhiro OKAMOTO Assistant Professor Togo SHINONAGA
URL	<a href="http://ntmlab.mech.okayama-u.ac.jp/index-e.html">http://ntmlab.mech.okayama-u.ac.jp/index-e.html</a>
Theme title	A study on high-performance nontraditional machining methods
Theme description and/or Additional info.	Our lab. deals with high-performance nontraditional machining methods, including EDM, EBM, and laser processing. Also, new machining methods based on these methods have been studied for the future. An applicant should help a graduate student with doing one of the research projects, and attend at the lab's regular meetings every week.
Requirements	Basic knowledges on "Machining Methods", "Engineering Materials", "Mechanical Design", and basic skill on "Information Processing"

No.	5
Department	Mechanical and Systems Engineering
Lab. name	Manufacturing Engineering Lab.
Staff	Professor Kazuhito OHASHI Assistant Professor Takashi ONISHI
URL	<a href="http://www.prec.mech.okayama-u.ac.jp">http://www.prec.mech.okayama-u.ac.jp</a>
Theme title	A study on a mechanism of superfinishing
Theme description and/or Additional info.	The superfinishing is carried out in some manufacturing processes of precision mechanical element such as ball bearings. In this study, we try to make clear the mechanism of superfinishing experimentally, analyzing the surface topography of abrasive stone and workpiece, the stock removal, finishing force, and so on. An applicant is required to attend at the lab's regular meetings every week and to present results in progress every other week.
Requirements	Basic knowledge on "Abrasive machining", "Precision measurement", and " Machine tool".

No.	6
Department	Mechanical and Systems Engineering
Lab. name	Fluid Dynamics
Staff	Professor Shinichiro YANASE, Associate Professor Toshinori KOUCHI, Assistant Professor Yoshinori NAGATA
URL	To appear
Theme title	CFD study, PIV measurement
Theme description and/or Additional info.	You have two choice. One is numerical study, where you learn how to calculate fluid flow by use of high performance computers. The other is experimental study, where you get some basic skill of measuring fluid velocity using PIV(Particle Image Velcimetry)
Requirements	Basic knowledge of PC such as C programming and Matlab, Analysis and differential equation, Introduction of Fluid Mechanics

No.	7
Department	Mechanical and Systems Engineering
Lab. name	Heat transfer engineering
Staff	Professor Akihiko HORIBE Assistant Professor Yutaka YAMADA
URL	<a href="http://heat6.mech.okayama-u.ac.jp/dennetu/">http://heat6.mech.okayama-u.ac.jp/dennetu/</a>
Theme title	A study on latent heat storage and heat release A study on water vapor sorption characteristics of a desiccant
Theme description and/or Additional info.	Our laboratory is specialized in heat transfer engineering, especially the research for effective utilization of thermal energy such as above-mentioned. An applicant is required to attend at the lab's regular meetings every week and to present results.
Requirements	Basic knowledge on heat transfer and thermal engineering

No.	8
Department	Mechanical Engineering
Lab. name	Heat Power Engineering Lab.
Staff	Professor, Eiji TOMITA Associate Professor, Nobuyuki KAWAHARA Assistant Professor, Kazuya TSUBOI
URL	<a href="https://powerlab.mech.okayama-u.ac.jp/">https://powerlab.mech.okayama-u.ac.jp/</a>
Theme title	Combustion and its related phenomena in internal combustion engines
Theme description and/or Additional info.	-Gas concentration measurement, Spark ignition, Flame development, Auto-ignition in an engine cylinder; Gas engine combustion; Diesel spray; Turbulent flame analysis, etc. An applicant is required to attend and to present results in progress at the lab's regular meetings every week.
Requirements	Basic knowledge on "Thermodynamics and Cycles", "Internal Combustion engines", and programming skills.

No.	9
Department	Mechanical and Systems Engineering
Lab. name	Cognitive Neuroscience and Biomedical Engineering Lab.
Staff	Professor Jinglong WU Associate Professor Satoshi TAKAHASHI Assistant Professor Jiajia YANG
URL	<a href="http://www.biolab.mech.okayama-u.ac.jp/indexE.html">http://www.biolab.mech.okayama-u.ac.jp/indexE.html</a>
Theme title	Study on Cognitive Neuroscience and Biomedical Engineering
Theme description and/or Additional info.	In order to develop the intelligent mechanical system and medical welfare equipment, we mainly study on cognition, behavior and brain's mechanism. Our research interest is to understand human brain function, such as vision, audition, touch, behavior, attention and language. Our research methods include cognitive psychology, electroencephalography (EEG), functional magnetic resonance imaging (fMRI) and image/signal analysis.
Requirements	Basic knowledge on "Cognitive Science", "Computer Programming", "Signal and Image Processing", and MATLAB programming skills.