

Bio-system Engineering

Course title	Course description	Instructor
生体材料学 Biomaterials	With the development of advanced medical care, various artificial biomaterials are applied to living bodies. Lecture on development trends and types in biological application points of these biomaterials, and on theoretical guidelines for developing biomaterials, including medicine, physiology and materials science.	山本 修 Osamu YAMAMOTO
生体システム特論 Biological System Engineering	This course focuses on how to apply our knowledge of human physiology to regenerative medicine. It includes biological homeostasis and how to create environment for cell culture; respiratory system and cellular oxygen uptake under culture; wound healing processes and the interactions between biomaterials and the human body. Finally, the applications of bioreactors and 3D printing technology in regenerative medicine are introduced.	馮 忠剛 Zhonggang FENG
生理機能の計測と解析 Analysis of Physiological Functions	The lecture focuses on the analysis and modelling of cardiovascular and respiratory control systems. Especially, this lecture will deal with topics such as emerging areas of system identification method for the cardiorespiratory regulatory system, modeling oxygen diffusion from red blood cell to peripheral tissue cells, and noninvasive methods for the measurement of skeletal muscle energy metabolism, to gain insight into the function of human body.	新 関 久 一 Kyuichi NIIZEKI
光ナノ計測 Optical Nanoscopy	Optical microscopy is widely used as a convenient method for observing microstructures in various research fields. In this lecture, optics, optical microscopy, single molecule spectroscopy and super-resolution fluorescence microscopy will be explained.	堀 田 純 一 Jun-ichi HOTTA
医用画像工学論 Medical Imaging Technology	Various kinds of medical imaging modalities such as computed tomography (CT) and magnetic resonance imaging (MRI), which are widely used in clinical scene, will be discussed from the viewpoints of data acquisition and data processing.	湯 浅 哲 也 Tetsuya YUASA

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マイクロプロセッサ応用工学 特論 Applied Microprocessor	This lecture deals with the progress of the technologies and the applications around the microprocessors from both sides of the hardware and the software. The outlines and the examples of various interfaces and their softwares to control the external devices for utilizing the microprocessors are also described.	金子 勉 Tsutomu KANEKO
ロボット工学特論 Advanced Robotics	This course teaches theories and applications of robots. First kinematics, dynamics, position control and force control of serial link manipulators are explained. Second parallel link manipulators, legged robots, micro manipulators will be introduced.	井上 健司 Kenji INOUE