

Title of the book "Introduction to Biomechanical Engineering (original text in Japanese)"

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Published on 17th May 2013 by Corona Publishing Co., Ltd. Tokyo, Japan.

ISBN978-4-339-07234-1

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Preface

The lecture is introduction for students, who are interested in biological and medical equipment, to learn basic mechanical engineering. The lecture is also introduction for students, who are studying engineering, to learn application of engineering to biological and medical equipment.

The lecture is trying to analyze human body in comparison with the machine, to consider cooperation between an organ and a machine in relation to medical devices for human, to study basic mechanical engineering to analyze a living body.

In recent years, several devices like artificial organs have been developed to substitute biological organs. To design the artificial organs, the biological function should be defined. In addition, quantitative specification is necessary for design of machine. The quantitative information about function of organs, however, is not enough for design of artificial organs. Data on normal organs are not enough compared with those on injured organs. Trial of the artificial organ helps analysis of biological function. The biological system may inspire an idea for the new machine.

In modern medical practice, various devices have been introduced. If you do not understand both the characteristics of devices and that of organs at the same time, however, there is a risk that devices are not properly used to the living body. Considering co-operation between devices and organs improves the devices to be applied to the living body.

The knowledge of mechanical engineering is available not only for the medical instrumentation, but also for biological understanding. The lecture may introduce readers to advanced learning for physiology and mechanical engineering.