

Advanced Mechanical Systems Design (Mikio HORIE , Chiaki SATO)

[Name of Lecture] Advanced Mechanical Systems Design

[Term] 2nd semester (October), Opened only in year of the odd number at the Christian era.,

[Units] 2-0-0

[Lecturers]

Prof. Mikio HORIE (mahorie@pi.titech.ac.jp ; Ext. 5048; Building-Room R2-214) and

Associate Prof. Chiaki SATO (csato@pi.titech.ac.jp ; Ext. 5062; Building-Room G2-516)

[Aim] The mechanical systems composed of machine elements, for example, actuators, sensors, mechanisms, etc., are introduced and their design methods are discussed in the fields of kinematics of machinery and strength of materials.

[Schedule]

(I) Lecturer: Prof. Mikio HORIE

1. Battery and actuators
2. Displacement sensors, force sensors, and torque sensors
3. Mechanism design I(Dynamic characteristics, kineto-elastodynamics, dynamic design)
4. Mechanism design II(Dynamic response of cam mechanisms)
5. Conceptual design I(Automatic generation of mechanical systems)
6. Conceptual design II[Interactive selection system of mechanisms based on fuzzy set theory, AHP(Analytic Hierarchy Process), and intelligent CAD systems]
7. Micromechanisms design I (Mechanical systems with large-deflective hinges)
8. Micromechanisms design II(MEMS(Micro Electro Mechanical Systems) and MOEMS(Micro Opto Electro Mechanical Systems))

(II) Lecturer:Associate Prof. Chiaki SATO

9. Mechanical properties of advanced materials
10. Structural design using finite element method I
11. Structural design using finite element method II
12. Structural design using finite element method III
13. Practical application of advanced materials
14. Technology to assemble or dismantle advanced machinery

[Texts] None (We'll use some prints)

[Prerequisite] None

[How to Grade] Final report / each lecturer

[Message from the Lecturer] None

[Office Hours]

When you would like to have some questions, etc., please send us them by E-Mails to <mahorie@pi.titech.ac.jp> or <csato@pi.titech.ac.jp>.