[Name of Subject]: Control Engineering

[Workloads]: Lecture

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[Objectives and Goals]:

The objective of this course is to provide students with an introduction to the basic principles and tools for analysis and design of feedback control systems which are often considered to be from the field of classical-control or frequency domain control theories.

[Topics and/or Descriptions]:

The topics to be covered in this course will include:

    Frequency response methods:
        Transfer functions and frequency responses
        Polar plots
        Bode diagrams
    Stability in frequency domain:
        Internal stability of Feedback systems
        Nyquist stability criteria
        Gain and phase margins
    Loop shaping design of feedback control systems:
        Loop shaping
        PID compensations
        Lead/lag compensations

[Keywords]:

Feedback control, Dynamical systems, Frequency response, Internal stability, Nyquist stability criterion, Stability margins, Loop shaping.

[Textbook]: M.Fujita and T.Sugie: Introduction to Feedback Control, Corona Publishing, 1999 (in Japanese).

[Assessment]: Homework 30%, Midterm exam 35%, Final exam 35%.

[Prerequisites]: Instrumentation and Control (2nd semester for Sophomore) or equivalent, Mathematics for Information and Control (1st semester for Sophomore) or equivalent.