Aerospace Control2

Syllabus Number 2C304
Special Subjects
Elective 2 credit
NAKAMIYA. Masaki

1. Course Description

This course provides the fundamentals in modern control theory centered on the state-space representation - as a continuation of classical control theory centered on the transfer function in Aerospace Control 1. This course includes laboratory experiments.
In this class, you will acquire specialized knowledge about DP2.

2. Course Objectives

1) Derive and solve the state-space equations
2) Understand Stability, Controllability and Observability
3) Design dynamic compensators via state feedback, pole allocation and observer
4) Explain linear quadratic optimal regulators
5) Understand the control of servo systems

3. Grading Policy

Homework: 20%, Mid-term exam: 40%, Final exam: 40%

4. Textbook and Reference

Textbook
川田昌克　MATLAB／Simulinkによる現代制御入門　森北出版
ISBN-13 : 978-4627920415
Reference
佐藤和也、下本陽一、熊澤良典　はじめての現代制御理論　講談社
ISBN-13 : 978-4061565081
小郷寛、美多勉　システム制御理論入門　実教出版
ISBN-13 : 978-4407022056
森泰親　わかりやすい現代制御理論　森北出版
ISBN-13 : 978-4627921412

5. Requirements(Assignments)

Linear Algebra, Aerospace Control 1

Preparation: To inform you of the next lesson schedule, please read the relevant part of the textbook before the next lesson, look up as much as possible of the words you do not understand, put them in a notebook, and start the lesson. (About 1.5 hours)
Review: Almost every class will give you some useful questions to review, so be sure to submit your answers. (About 1.5 hours)

6. Note

It is strongly recommended that students have completed the first three years of "Aerospace Control 1".
Class content is subject to change depending on progress.

7. Schedule

[1] Classical control theory and Modern control theory
[2] State Variable Analysis
[3] State Equations and Transfer Functions
[4] Solution of State Equations (Variation of constants)
[5] Solution of State Equations (Laplace transformation)
[6] Stability
[7] Similarity Transformation
[8] Controllability and Observability
[9] Mid-term exam
[10] Pole allocation
[11] Observer
[12] Optimal regulator (Introduction)
[13] Optimal regulator (Design)
[14] Servo system (Introduction)
[15] Servo system (Design)