Modern Control System Theory and Design

Chemical Engineering Program，Tongji University

Spring 2023

Instructor: Min Huang, PhD

In-person: Thursday 7th & 8th periods, 314 North Building

Online: <https://courses.tongji.edu.cn> Course

Course Website: <https://mestudio.tongji.edu.cn>

Sidebar —> Teaching —> Under —> Process Control 2023 Spring

Text Book and References:

“Modern Control Engineering”, 5ed, (2010) [现代控制工程], Katsuhiko Ogata,

“Modern Control System Theory and Design”, 2nd Ed., (1998) S. M. Shinners

Lecture Notes

Assignments:

Weekly assignments are to be given and due at the following week regular lecture time. (Late assignments will be accepted with 50% credit)

Grading Policy:

Attendance/Quiz 10%, Midterm I/II 25%, Final 30%, Homework+Term project 25%

Average exceeds: 90% A 80% B 70% C 60% D

Tentative Schedule:

1 General Concept of Control-System Design

2 Fourier and Laplace Transform

3 Transfer Function

4 Signal-Flow Graphs and Mason’s Theorem

5 Matrix Algebra, State-Variable Method

6 Midterm I

7 Mathematical Modeling of Chemical Processes

8 Mathematical Modeling II

9 Transfer-Function Representation of Control-System Elements

10 Time-Domain Response

11 Performance Criteria

12 Midterm II

13 Nyquist-Diagram

14 Bode-Diagram

15 Root-Locus Method

16 Linear Control-System Compensation and Design

17 Final