

Modern Control System Theory and Design
Chemical Engineering Program, Tongji University
Spring 2021

Instructor: Min Huang, PhD
In-person: Thursday 5th & 6th periods, 316 North Building
Online: <https://courses.tongji.edu.cn> Course ID 2369
Course Website: <https://mestudio.tongji.edu.cn>
Teaching → Under → Process Control 2021 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. Shinnars
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+Homework 25%, Midterm I/II 25%, Final 25%, 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