

ChE 4113 Process Control
Required course for ChE program

Catalog Description: Principles of the design of automatic control loops for the chemical processes including feed-forward, cascade, ratio and multivariable process control. Design of computer control systems. Emphasis on safety and P&ID diagrams.
Prerequisite: ChE 3084 and ChE 3112.

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Prerequisites by Topic: mass/energy balances, reaction kinetics, differential equations

Recent Textbook: *Process Dynamics and Control, 2nd Edition*, by Seborg, Edgar and Mellichamp, Published by John Wiley & Sons, 2004.

Other Required Materials: None

Course Objectives: By the end of the course the students will be able to:

1. specify equipment and draw P&IDs for feedback control systems with emphasis on safety and system stability;
2. tune PID controllers
3. implement feedback control techniques on physical systems;
4. specify equipment, draw P&IDs and implement on computer control systems automatic control loops that include feed forward, cascade, ratio, and multivariable process control
5. analyze processes for safety concerns and design solutions to potential problems including pressure relief components.

Major Topics Covered in the Course: (1) hardware and tuning, (4) advanced control systems, (5) steady state vs. dynamic design, (6) safety and control systems

Class/Laboratory Schedule: Lecture meets for two 75-minute sessions each week for 14 weeks.

Professional Component Contribution: This course applies mathematics to mass/energy balances and control systems. One design project is assigned in this course.