CHBE320 Process Control, Fall, 2021
Department of Chemical and Biological Engineering
Korea University

1. Instructor: Prof. Dae Ryook Yang

- Contact Information: New Engineering Building 719 (OFFICE)

  Tel: 02-3290-3298, email: dryang@korea.ac.kr

- Class Website: http://www.cheric.org/edu/lecture/process/CHBE320

- Lecture Hours: 10:30-11:45pm (Mon), 10:30-11:45am (Wed) at ChangEui Bld. 116

- Office Hours: 13:30-14:30 (Mon, Wed)

2. Course Objectives:

- Learn what the process control is.
- Basic theory and principals of PID controller
- Dynamic modeling and solving ODE system with Laplace transform
- Analysis of dynamic behavior of open and closed loop control system

3. Preliminary Course Outline:

W	Period	Exam	Contents	Text	Ref.
1	9.01~ 9.07		Fundamental concepts: Feedback, Feedforward control		
2	9.08~ 9.14		Basics of PID controller		
3	9.15~ 9.21		Sensors		
4	9.22~ 9.28		Actuators		
5	9.29~ 10.04		Laplace transform and Transfer function		
6	10.06~ 10.12		Dynamics of lower-order system		
7	10.13~ 10.19		Dynamics of higher-order system		
8	10.20~ 10.26	MidTerm			
9	10.27~ 11.02		Dynamics and analysis of closed-loop system		
10	11.03~ 11.09		Stability of closed-loop system I		
11	11.10~ 11.16		Stability of closed-loop system II		
12	11.17~ 11.23		Controller Design and Tuning I		
13	11.24~ 11.30		Controller Design and Tuning II		
14	12.01~ 12.07		Frequency Analysis I		
15	12.08~ 12.14		Frequency Analysis II		
16	12.15~ 12.21	Final	Summary and Conclusions		

*** **9/20 (Mon): ChuSoek**

10/4 (Mon): Substitute holiday

10/11(Mon): Substitute holiday

(Class will be taught at two out of three holidays)

4. Textbooks:

- Lecture Notes
- Seborg D.E., T.F. Edgar, D.A. Mellichamp, and Doyle F.J., *Process Dynamics and Control*, 3rd Ed., John Wiley & Sons Inc., New York, NY (2011)

5. References:

- Ogunnaike & Ray, *Process Dynamics, Modeling, and Control,* Oxford University Press, 1994
- Stephanopoulos, G., *Chemical Process Control*, Prentice-Hall Inc., Englewood Cliff, New Jersey, 1984.

6. Evaluation:

- Attendance (10%)
- Midterm (30%)
- Final exam (40%)
- Homework (20%)
- Participation (Extra 5%)

7. Lecture Aids:

- JavaScript modules

8. Teaching Assistants:

- Min Seok Lee: New Engineering Building Rm 709, (02) 3290-3782
  email: vee1305@korea.ac.kr
- Another TA will be announced later if needed.

9. URLs:

Lecture Homepage: http://www.cheric.org/education/lecture/process/CHBE320

JavaScript modules: http://www.cheric.org/education/ lecture/process/JSmodule.html

Q&A: http://www.cheric.org/board/board.php?code=CHBE320