

**CHBE320 Process Control, Fall, 2020**  
**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: 14:00-15:15pm (Tue), 14:00-15:15am (Thr) at ChangEui Bld. 116
- Office Hours: 11:0-12:00 (Tue, Thr)

**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~ 9.06		Fundamental concepts: Feedback, Feedforward control		
2	9.07~ 9.13		Basics of PID controller		
3	9.14~ 9.20		Sensors		
4	9.21~ 9.27		Actuators		
5	9.28~ 10.04		Laplace transform and Transfer function		
6	10.05~ 10.11		Dynamics of lower-order system		
7	10.12~ 10.18		Dynamics of higher-order system		
8	10.19~ 10.25	MidTerm			
9	10.26~ 11.01		Dynamics and analysis of closed-loop system		
10	11.02~ 11.08		Stability of closed-loop system I		
11	11.09~ 11.15		Stability of closed-loop system II		
12	11.16~ 11.22		Controller Design and Tuning I		
13	11.23~ 11.29		Controller Design and Tuning II		
14	11.30~ 12.06		Frequency Analysis I		
15	12.07~ 12.13		Frequency Analysis II		
16	12.14~ 12.20	Final	Summary and Conclusions		

\*\*\* 10/01 (Thr): No class due to ChuSoek

**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:**

- Java Applets

**8. Teaching Assistants:**

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

**9. URLs:**

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|------------------------|---|
| Lecture Homepage:      | <a href="http://www.cheric.org/education/lecture/process/CHBE320">http://www.cheric.org/education/lecture/process/CHBE320</a> |
| Java applets:          | <a href="http://www.cheric.org/education/control">http://www.cheric.org/education/control</a>                                 |
| Q&A:                   | <a href="http://www.cheric.org/board/board.php?code=CHBE320">http://www.cheric.org/board/board.php?code=CHBE320</a>           |
| Process control forum: | <a href="http://www.cheric.org/board/index.php?code=f06">http://www.cheric.org/board/index.php?code=f06</a>                   |