# SYLLABUS
## AUTOMATIC CONTROLS- FALL 2018

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| Instructor: | Youngshik Kim, 6-407, youngshik@hanbat.ac.kr, 821-1163. |
| Office Hours: | M, W 1:30pm-2:00pm, or by appointment. |
| Lecture Time: | TBA |
| Lecture Location: | TBA |

Course Objectives: This course first reviews classical control systems and techniques. The main focus will be on classical control theories and techniques used for the design of feedback control systems, including root-locus, Bode, and Nyquist plots. Students will learn modeling and classical control techniques in the time and frequency domains. Students will also study stability conditions in each domain. Students will then design controllers such as P, PI, PID, phase-lead, and phase-lag filters. Applications will range across electrical, mechanical, chemical, biomedical, and biological systems.

Prerequisites: Upper Division Status. Linear Algebra

Textbook: Control System Engineering (제어시스템공학), 7th Ed., Norman S. Nise, Wiley, 2015

Class Website: Visit the following sites for class handouts and additional information:
http://robot.hanbat.ac.kr -> teaching -> automatic controls or
Q&A: http://cyber.hanbat.ac.kr/

Quiz/homework Policies:

1. Quizzes will be given out infrequently at the beginning of class (~15 minutes, 부정기적 퀴즈). These will be based entirely on the reading material covered in previous classes.
2. No cheating in quizzes (no cheating papers, no text books, no talking, no lecture notes, 부정행위 금지)
3. Grading: each homework problem will be evaluated on a 3-point scale: 3 = good effort, results, and technique; 2 = modest effort with some incorrect technique or results; 1 = poor effort or technique; and 0 = no attempt.
4. Homework must be submitted in class on the date due.
5. Late homework will be marked down 10% per business day unless prior arrangements exist.
6. Discussion of homework and teamwork is encouraged, but each student must complete each assignment individually. Figures and computer programs CANNOT be shared.
7. Homework may be discussed in class, but it is the students' responsibility to compare their results to homework solutions to resolve errors in their work.

Exam Policies:

1. Examinations must be taken at the scheduled time unless prior arrangements are made at least two weeks before the exam.
2. Any students cheating on an exam will receive a failing grade for the class (부정행위 시 F).
3. No smartphone or devices except for a calculator. (계산기외 다른 스마트 기기 금지)

Grading Polices:

1. No negotiation for grades. (학점 올려달라고 연락하거나 찾아오지 말 것, 점수 깎일 수 있음)
2. Student presence will be checked each class. Exemption will be applied according to School Policies (Article 99, 학사운영규정 제 99조에 따라 출석 인정); 수업 1/4 (4회)이상 결석 시 F.
3. Penalties for inappropriate behaviors or attitudes in class; 수업태도 불량, 잡담 등 수업에 방해되는 행위 시 불이익.

Grade Weightings: Quiz/homework: 20% (due in class)
Midterm Exam: 30%
Final Exam: 40%
Class attendance/attitude: 10%

**SCHEDULE** (subject to change)

| **Week** | **Topic** | | **H/W (숙제)** |
|---|---|---|---|
| 1 | Introduction to Control Systems | 제어 시스템 서론 | |
| 2 | Math Review (Laplace transforms, transfer function) | 수학 리뷰 (라플라스 변환, 전달함수) | 2.1, 2.2, 2.7, 2.8 |
| 3 | Block diagram, State Space, Matlab Basics | 블락다이어그램, 스테이트 스페이스, 매틀랩 기초 | 2.5, 3.6, 5.1(a), 5.4 |
| 4 | Modeling of Dynamic Systems | 동적 시스템 모델링 | 2.16, 2.23, 2.24, 2.25, 2.42, |
| 5 | Transient-Response Analysis | 과도응답 해석 | 4.2, 4.3, 4.24, 4.25, 4.29 |
| 6 | Steady-State Error Analysis | 정상상태 해석 | 7.3, 7.5, 7.21, 7.31, 7.44 |
| 7 | Midterm Exam | 중간고사 | |
| 8 | Stability | 안정성 | |
| 9 | Routh-Hurwitz | Routh-Hurwitz | 6.9, 6.19, 6.21, 6.33 |
| 10 | Root Locus | 근궤적법 | |
| 11 | Control System Design by Root Locus | 근궤적법 응용 제어시스템 설계 | 8.10, 8.15, 8.20, 8.21, 8.32 |
| 12 | Frequency-Response Analysis | 주파수 응답해석 | |
| 13 | Stability in Frequency Domains | 주파수 영역에서 안정성 | |
| 14 | Controller Design by Frequency Response | 주파수 응답 응용 제어시스템 설계 | |
| 15 | Final Exam | 기말고사 | |

# 자동제어 숙제 표지 샘플

## (문제 번호)

반/수업시간:

제출일:

학번:

이름: