University of Kurdistan
Department of Electrical Engineering

Linear Control Systems

(Fall 2019)

Instructor: Q. Shafiee (g.shafiee@uok.ac.ir)

Course Objectives

The objective of the course is to familiarize the students with control engineering and to introduce them the art of control system design, more particularly

- to understand the essentials and principle of mathematical system modeling,
- to be able to assess stability and performance properties of linear systems,
- to be able to design and evaluate feedback control systems with desired performance.

Topics Covered

1. An Introduction to control systems
2. Mathematical modeling of dynamic systems
3. Transient response for first and second order systems
4. Stability concepts
5. Root locus analysis
6. Frequency response techniques: Nyquist criterion, Bode plots.
7. Controller design

Grading

The course grade will be determined using the following:

- Homework and Project: 15%
- Midterm Exam 35%
- Final Exam: 50%
- Optional Project: 5%

References

[1] Q. Shafiee, **Class Lecture Notes**, Fall Semester, 2019.

[2] K. Ogata**, Modern Control Engineering,** 3rd Ed., Prentice, Hall 1997.

[3] Norman S. Nise, **Control Systems Engineering**, 6th Ed., Wiley, 2011.

[4] R.C. Dorf**, Modern Control Systems,** 9th Ed., Prentice Hall 2001.

[5] Benjamin C. Kuo**, Automatic Control Systems,** 7th Ed., Prentice Hall, 1995.

[۶] علی خاکی صدیق، **تحلیل و طراحی سیستم های کنترل خطی**، انتشارات دانشگاه صنعتی خواجه نصیرالدین طوسی، ۱۹۹۳.

Teaching Assistant

Navid Mohammadi, Master Student at UOK (navid.m2712@gmail.com)

Homework Assignments

Homework and other assignments will be given periodically and will be due on the designated due-date. Late homework will be accepted only in exceptional circumstances which need to be discussed with the Instructor for approval.

Note: Students may discuss the problems with other students, but are not allowed to share solutions (MATLAB m-files, etc.).

Final Project

Some small projects will be assigned to you along the semester. All the techniques and methods you learn in this course should be applied to the chosen system. This will give you a chance to deepen your knowledge in your area of interest. You will provide a detailed standard report once you are done with the simulations.