EEEQ414 Control Systems Engineering B 60 hrs. 1.25 units

Bachelor of Engineering in Electrical & Electronic Engineering.

Lecturer: Mr. Benard Mumo Makaa (www.benardmakaa.com)

Course Outline

Main Textbook

Norman S. Nise, (2015) Control Systems Engineering, Wiley.

Reference Textbooks

1. Norman S. Nise, (2015) Control Systems Engineering, Wiley.
2. Distefano J. J, Stubberud A.R.,& Williams I.J (2013), Feedback and Control Systems; Theory and Problems (Schaum's Outline Seties), McGraw-Hill.
3. Ogata K. (2016), Modern Control Engineering, Prentice Hall.
4. Kuo, B.C, &Farid G. (2017), Automatic Control Systems, Wiley.
5. Gene F., (2014), Feedback Control of Dynamic Systems, Prentice Hall.

Week 1-Week 4

CAT 1, LAB 1, Assignment 1

A. Compensation of feedback control systems:

- Introduction to compensation.
- Reasons for compensation.
- Improving System Performance.

B. Types of compensation:

- Lag Compensation
- Lead Compensation
- Lag-Lead Compensation.

Week 5-Week 10

CAT II, LAB II, Assignment 2

C. Approaches to compensation:

Dynamic compensation: Design by Root Locus and Frequency Response.

- Proportional (P) and Integral (I) controllers.
- Proportional and Differential (D) controllers.
- Proportional Integral and Differential compensation (PID) controllers;
- Dynamic compensation and system simulation using operational amplifiers.

D. Cascade compensation networks:

- System simulation using amplifiers.
- System compensation using phase-lead lag networks.

Week 11

E. Public/Guest Lecture-Industrial Visit