Faculty of Engineering & Technology

Control Systems 1

Information :

Course Code :	CMP 371	**Level** :	Undergraduate	**Course Hours :**	3.00- Hours

Department :	Department of Electrical Engineering

Instructor Information :

Title	Name	Office hours
Professor	Said Fouad Mohamed Mekhemar	3
Assistant Lecturer	Ahmed Moreab Hussien Mohamed	

Area Of Study :

˝Enrich studentsˋknowledge about theory of classical LTI control systems.
˝Train student to analyze and enhance the performance of control systems.

Description :

Introduction to control systems, Advantages of closed-loop feedback systems, The role of the system mathematical model, Block diagrams and signal flow graphs, The basic control system design problem, stability in control systems, Frequency response analysis techniques, Root-locus analysis, Elementary lead-lag compensation, Examples on continuous control systems, Transient response, Static error analysis, Frequency response, Polar plots, Logarithmic plots, Relative stability, Root locus, Compensation in frequency domain.

Course outcomes :

a.Knowledge and Understanding: :

1 -	Recognize the design problems of closed loop feedback control systems.
2 -	Illustrate the Mathematical Modeling of different analog control system.
3 -	Explain the different frequency response analysis techniques.
4 -	a4. Discuss the modeling and analysis using state space representation.

b.Intellectual Skills: :

1 -	Think in a creative way to solve control systems problems.
2 -	Apply appropriate mathematical models to design control system.
3 -	Analyze control systems using appropriate methods.
4 -	Write a technical report on an assignment.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Mathematical Modeling of Control Systems	5	3	2
Mathematical Modeling of Electrical and Mechanical Systems	5	3	2
Transient and Steady-State Response Analysis	5	3	2

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Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
The Root Locus Methods	5	3	2
Design Based on The Root Locus Methods	5	3	2
Design Based on The Root Locus Methods	5	3	2
Bode Diagrams	5	3	2
Bode Diagrams	5	3	2
Design Based on Bode Diagrams	5	3	2
State Space Representation and Analysis	5	3	2
Pole Placement Design	5	3	2
State Observers	5	3	2
State Observers	5	3	2
Servo Systems	5	3	2
Servo Systems	5	3	2

Teaching And Learning Methodologies :

Interactive Lecturing

Discussion.

Problem Solving

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Final exam	40.00		
In Class Quizzes	10.00		
Mid-Term exams	30.00		
Participations	10.00		
Reports	10.00		

Recommended books :

Automatic Control Systems, B. C. Kuo and F. Golnaraghi, 9th edition or higher, 2010, John Wiley & Sons, Inc.
Modern Control Systems, R. C. Dorf, R. H. Bishop, 12th edition or higher, 2010, Prentice Hall
Automatic Control Systems with MatlaB programs, S. Hasan Saeed, 2013.
Control Systems Engineering, N. S. Nise, 6th edition or higher, 2010, John Wily

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