Faculty of Engineering & Technology

Control Systems 2

Information :

Course Code :	CMP 472	**Level**	: Undergraduate	**Course Hours :**	3.00- Hours

Department :	Specialization of Electrical Power Engineering

Instructor Information :

Title	Name	Office hours
Lecturer	Sameh Abdelhaleem Mohamed Abdelsalam	4
Teaching Assistant	Youmna Elsayed Abd Elalem Mohamed Sayed Ahmed	

Area Of Study :

˝Enrich Students Knowledge with the basic concepts of discrete-time control systems (Digital Control Systems) Discrete Linear Time Invariant systems only will be considered.
˝Comprehend Transient response analysis and
˝Develop students skills for Steady state error analysis, Stability analysis, Root locus analysis and Frequency response method, and State space methods.

Description :

Discrete-time signals and systems; z-Transform analysis; Pulse transfer function and discrete-time feedback system; Static error, Jury stability test, and system sensitivity; Frequency-domain and state space analysis and design of discrete-time systems using Matlab; Digital controller implementation issues.

Course outcomes :

a.Knowledge and Understanding: :

1 -	Outline the Mathematical Modeling of different digital control systems.
2 -	Illustrate the stability of control systems, transient response and steady-state error.
3 -	Explain the root locus and bode diagram for control systems and the design of digital controllers using conventional methods
4 -	Illustrate the state space representation, analysis and the steps of the design of controllers and observers.

b.Intellectual Skills: :

1 -	Select appropriate mathematical and computer-based methods for modeling and analyzing problems
2 -	Design digital control systems applying appropriate knowledge and principles
3 -	Select appropriate solutions for engineering problems based on analytical thinking.
4 -	Analyze system, processes and components critically.

c.Professional and Practical Skills: :

1 -	Write MatLab code for developed design methods.
2 -	Apply gained hardware and software skills to controller design in diverse applications

d.General and Transferable Skills: :		
	1 -	Collaborate effectively within multidisciplinary team.
	2 -	Communicate effectively

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
The z Transform	5	3	2
The Pulse Transfer Function	5	3	2
Mapping between the s Plane and the z Plane	5	3	2
Transient and Steady-State Response Analysis	5	3	2
The Root Locus Methods	5	3	2
Design Based on The Root Locus Methods	10	6	4
Bode Diagrams	5	3	2
Design Based on Bode Diagrams	10	6	4
State Space Representation and Analysis	5	3	2
Pole Placement Design	5	3	2
State Observers	5	3	2
Servo Systems	5	3	2

Teaching And Learning Methodologies :

Interactive Lecture
Problem based learning
Discussion
Experiential learning

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Assignment	7.00		
Computer Assignment	8.00		
Final exam	40.00		
Mid- Exam 1I	15.00		
Mid- Exam I	15.00		
Participation	5.00		
Quizzes	10.00		

Recommended books :

http://www.fue.edu.eg

˝Digital Control System Analysis and Design, Charles L. Phillips, H. Troy Nagle, 3rd Edition, 1994, Prentice-Hall
˝Digital Control of Dynamic Systems, G. Franklin and J. Powell and M. Workman, 3rd Edition, 1998, Prentice-Hall
˝Discrete Time Control Problems Using Matlab by Joe H. Chow, Dean K. Frederick, Nicolas W. Chbat, October 2002, CL Engineering
˝Periodicals, Web Sites, õ Áetc
Any web site on control systems