FUTURE UNIVERSITY IN EGYPT جامعة المستقبل

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
Professor	Hany Mohamed Hasanien Mohamed	2
Lecturer	Sameh Abdelhaleem Mohamed Abdelsalam	2
Assistant Lecturer	Mohamed Abdallah Mahmoud Shaheen	6
Teaching Assistant	TOAA ABDELSALAM ELSAYED MOHAMED	
Teaching Assistant	Ahmed Mahmoud Mohamed Mahmoud Hegazy	

Area Of Study :

ÅEnrich Studentsôknowledge with the basic concepts of discrete-time control systems (Digital Control Systems) Discrete Linear Time Invariant systems only will be considered.
ÅComprehend Transient response analysis and
ÅDevelop studentsôskills 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 :

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