

Faculty of Engineering & Technology

Control Systems

Information :

Course Code : CMP 470

Level : Undergraduate

Course Hours : 3.00- Hours

Department : Department of Mechanical Engineering

Instructor Information :

Title	Name	Office hours
Professor	Abdel Monem Abdel Hamid Ahmed Seif	2
Assistant Lecturer	Rana Mohamed Abdel Rahman Saleh	4

Area Of Study :

By the end of the course the students will be able to:

- 1) Demonstrate basic understanding of linear feedback systems modeling and stability.
- 2) Gain knowledge of classical control techniques for single input single output systems

Course outcomes :

a. Knowledge and Understanding: :

1 -	Identify basic applied and engineering science.
2 -	Identify principles of discrete time systems analysis and modeling of digital control of various fields of mechanical engineering and some other engineering disciplines.
3 -	Identify principles in the field of design of fluid flow, thermodynamics, gas dynamics, turbo-machinery, heat transfer engineering and fundamentals of thermal and fluid processes

b. Intellectual Skills: :

1 -	Define computer-controlled design problems in mechanical engineering and evaluate designs, processes, and performance and propose improvements.
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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 mechatronics applications.

d. General and Transferable Skills: :

1 -	Collaborate effectively within multidisciplinary team.
2 -	Share ideas, communicate effectively and work in stressful environment and within constraints.
3 -	Lead and motivate individuals and work with others according to the rules of the professional Ethics.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Review of transform techniques and systems analysis	4	2	2
Introduction to Feedback systems	4	2	2
Block diagrams and signal flow graphs	4	2	2
System time response and stability	8	4	4
Basic control systems specifications	8	4	4
Root locus methods and relative stability	8	4	4
Frequency response and Bode plots	12	6	6
PID controller design	4	2	2
Compensation in frequency domain	12	6	6

Teaching And Learning Methodologies :

Lectures
Tutorial
Class discussions and activities
Homework and self-study

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
FinalWrittenExam	40.00	16	
FirstAssignment	5.00	4	
MidTermExam	20.00	6	
SecondAssignment	5.00	9	
SecondMidterm	20.00	11	

Recommended books :

M.S. Fadali and A. Visionli, Control Engineering: Analysis and Design, Prentice Hall, USA..
G.F. Franklin, J. D. Powell, and A. Emami-Naeini, Feedback Control of Dynamic Systems, Prentice Hall, USA..