Course Description Form

1. Course Name:
Control and Measurements
2. Course Code:
MPAC410
3. Semester / Year:
yearly(2024-2025)
4. Description Preparation Date:
The beginning of the academic calendar for the year (2024-2025)
5. Available Attendance Forms:
Weekly / theoretical and practical
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hours / 4 units
7. Course administrator's name (mention all, if more than one name)
Name: Ahmed Ehsan Email: ahmedahssan83@gmail.com:
8. Course Objectives

Course Objectives	1. Identification of the types and components of control systems. 2. Capacity to represent electrical and mechanical systems in the form of circuits of control 3. Analysis of the exit signal from the control systems.

9. Teaching and Learning Strategies	
Strategy	1. Lectures. 2. Use of blackboard and telephones. 3. Computer use.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	2 Theoretical + 2 practical.	The student understands the subject	Introduction to Control Systems, Open and Closed Systems.	Theoretical + practical	quiz

2nd week	2 Theoretical + 2 practical	The student understands the subject	Introduction to Control Systems, Open and Closed Systems.	Theoretical + practical	quiz
3rd week	2 Theoretical + 2 practical	The student understands the subject	Mathematical Modeling of Physical Systems and Transfer Functions, Mathematical Modeling of D.C. Servo Motor.	Theoretical + practical	quiz
4th week	2 Theoretical + 2 practical	The student understands the subject	Mathematical Modeling of Physical Systems and Transfer Functions, Mathematical Modeling of D.C. Servo Motor.	Theoretical + practical	quiz
5th week	2 Theoretical + 2 practical	The student understands the subject	Mathematical Modeling of Physical Systems and Transfer Functions, Mathematical Modeling of D.C. Servo Motor.	Theoretical + practical	quiz
6th week	2 Theoretical + 2 practical	The student understands the subject	Mathematical Modeling of Physical Systems and Transfer Functions, Mathematical Modeling of D.C. Servo Motor.	Theoretical + practical	quiz
7th week	2 Theoretical + 2 practical	The student understands the subject	Block Diagrams.	Theoretical + practical	quiz
8th week	2 Theoretical + 2 practical	The student understands the subject	Block Diagrams.	Theoretical + practical	quiz
9th week	2 Theoretical + 2 practical	The student understands the subject	Time Domain Analysis of Closed Loop Control 10Systems and Error Analysis.	Theoretical + practical	quiz
10th week	2 Theoretical + 2 practical	The student understands the subject	Time Domain Analysis of Closed Loop Control	Theoretical + practical	quiz

			Systems and Error Analysis.		
11th week	2 Theoretical + 2 practical	The student understands the subject	P, PI, PD, and PID	Theoretical + practical	quiz
12th week	2 Theoretical + 2 practical	The student understands the subject	Modes of Feedback	Theoretical + practical	quiz
13th week	2 Theoretical + 2 practical	The student understands the subject	Control, Realization of	Theoretical + practical	quiz
14th week	2 Theoretical + 2 practical	The student understands the subject	PID Controller Using Active and Passive Elements.	Theoretical + practical	quiz
15th week	2 Theoretical + 2 practical	The student understands the subject		Theoretical + practical	quiz
16th week	2 Theoretical + 2 practical	The student understands the subject	P, PI, PD, and PID	Theoretical + practical	quiz
17th week	2 Theoretical + 2 practical	The student understands the subject	Modes of Feedback	Theoretical + practical	quiz
18th week	2 Theoretical + 2 practical	The student understands the subject	Control, Realization of	Theoretical + practical	quiz
19th week	2 Theoretical + 2 practical	The student understands the subject	PID Controller Using Active and Passive Elements.	Theoretical + practical	quiz
20th week	2 Theoretical + 2 practical	The student understands the subject	Stability Analysis and Rouths Stability Criterion.	Theoretical + practical	quiz
21st week	2 Theoretical + 2 practical	The student understands the subject	Stability Analysis and Rouths Stability Criterion.	Theoretical + practical	quiz
22nd week	2 Theoretical + 2 practical	The student understands the subject	Root Locus Technique.	Theoretical + practical	quiz
23rd week	2 Theoretical + 2 practical	The student understands the subject	Root Locus Technique.	Theoretical + practical	quiz
24th week	2 Theoretical + 2 practical	The student understands the subject	Analysis of Control	Theoretical + practical	quiz
25th week	2 Theoretical + 2 practical	The student understands the subject	System in Frequency Domain and Bode Diagrams.	Theoretical + practical	quiz
26th week	2 Theoretical + 2 practical	The student understands the subject	Analysis of Control	Theoretical + practical	quiz
27th week	2 Theoretical + 2 practical	The student understands the subject	System in Frequency Domain and	Theoretical + practical	quiz

			Bode Diagrams.		
28th week	2 Theoretical + 2 practical	The student understands the subject	Control System Design Using Bode Diagrams.	Theoretical + practical	quiz
29th week	2 Theoretical + 2 practical	The student understands the subject	Control System Design Using Bode Diagrams.	Theoretical + practical	quiz
30th week	2 Theoretical + 2 practical	The student understands the subject	Definitions of Non Linear Systems.	Theoretical + practical	quiz

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	K. Warwick, An Introduction to Control Systems, 2nd ed., vol. 8
Main references (sources)	K. Ogata, Modern Control Engineering, 3rd e Upper Saddle River, NJ 07458: PrenticeHall, Inc. , 1997 .
Recommended books and references (scientific journals, reports…)	Problems and solutions of cotrol systems by A. K. Jairath.
Electronic References, Websites	https://highperformancehvac.com/control-circuits-for-hvac-systems/