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Department of Mechatronics Engineering	
Control Systems Lab. (67571)	
Total Credits	**1**
major compulsory	
Prerequisites	P1 : Control Systems I (67471) P11Synch. : Control Systems I (67471)

Course Contents

Open and closed loop control systems with applications to level and flow of fluids, and electrical, electromechanical, and thermal systems. Position and speed Control. Principles of controlling servomechanisms and stability tests. System performance under the action of proportional (P), integral (I), derivative (D) compensation controllers. Time and frequency response measurements. Computer simulation of control systems using MATLAB and SIMULINK software.

	Intended Learning Outcomes (ILO's)	Student Outcomes (SO's)	Contribution
1	Ability to conduct experiments and analyze interpret data related to PID controller, feedback control systems and transducers selection to design feedback controlled process.	B	50 %
2	Be able to use the devices of the lab properly and write scientific reports	K	35 %
3	Be able to work in team	D	15 %

Textbook and/ or Refrences

Laboratory Manuals, Handouts and Data Sheets

Assessment Criteria	Percent (%)
Mid. Term Exam	20 %
Quizzes	5 %
Laboratory Work	45 %
Final Exam	30 %

Course Plan

Week	Topic
1	Introduction to Process Control Laboratory
2	Explanation of the Laboratory Experiments (Group I)
3	Experiment No. 1-A: Level-Pressure-Flow Rate Transducers (G30A) Experiment No. 1-B: Level and Flow Rate Control (G30B)
4	Experiment No. 2: Luminosity Transducer and Control (G13)
5	Experiment No. 3: Temperature Control and Transducers (G34)
6	Experiment No. 4: Pressure Control (G35)
7	Experiment No. 5: Flow Rate control (G30B)
8	Midterm Exam
9	Explanation of the Laboratory Experiments (Group II)
10	Experiment No. 5: Speed &Position Transducers and Control (G36A)
11	Experiment No. 6: 3 Phase Induction Motor Speed Control (G37)
12	Experiment No. 7: PWM Speed Regulation of a DC Motor (G14)
13	Experiment No. 8: Stepper Motor Control (G16)
14	Experiment No. 9: Process Control Simulator (G26)
15	Final Exam