ME 323: Mechanical Engineering Laboratory-2 Syllabus
2nd Semester 1442

Course Description:

The course is designed to introduce students the practical areas of solid mechanics, mechanics of machinery and, system dynamics and control by conducting lab tests using lab scale experimental set up. The students are trained to make full-fledged reports and also trained in group work. A revision of the prominent areas like solid mechanics, system dynamics, mechanics of machinery, vibration and control is done theoretically. Then, it is accompanied by an emphasis on application of classroom theory to experimental engineering and on interpretation and presentation of results.

Seq	Experiment	Week
1	General Lecture for the course	1
2	Modulus of Elasticity Determination	2
3	Investigation the relation between span and deflection at same constant load	3
4	Investigation the relation between beam width and the deflection at constant	4
5	Buckling in Columns	5
6	Thin walled pressure vessels and strain gauge application.	6
7	Midterm Exam	7
8	Governor mechanism	8
9	Quick return and four-bar mechanisms	9
10	Mass balancing (Static and Dynamic)	10
11	Coriolis acceleration	11
12	Spring mass system	12
13	Free damped, un-damped, forced vibrations with frequency response	13
14	Response of liquid level system	14
15	DC motor speed PID control and temperature control	15

Assessment: Midterm Exam 10

Midterm Exam	10
Experiments and reports (Dr. Ahmed Fouly 20 + Dr. Eyyup 20)	40
Final Exam	40

Learning resources (1: required, 2-5: recommended)

1-Lab Manuals and instructor lecture notes

2- Design of Machinery, Robert Norton, McGraw-Hill Education, 5th Edition, 2011

3- Engineering Vibration by Daniel Inman, 3rd Edition, Prentice-Hall, 2007

4- System Dynamics, Palm III, W.J., McGraw-Hill Education, 3rd Edition, 2013

5- Mechanical Measurements, Prentice Hall, Thomas G. Beckwith, Roy D. Marangoni, John H. Lienhard V, 6th Edition, ,2006