ME 305

Introduction to System Dynamics

Text-Book: **K. Ogata, SYSTEM DYNAMICS, Prentice-Hall, 4th Ed. 2004.**

Prerequisites: ME 231, Mech 236 and Math 222 *or* consent of the instructor

Week	Topic	Reading	Homework
Week 1	Introduction, Complex Algebra, Laplace Transforms, Inverse Laplace Transforms	Ch.1 Ch.2.1-2.4	B-2-1,B-2-2(b),B-2-3, B-2-5,B-2-10, B-2-15,B-2-19, B-2-20
Week 2	Linear Differential Equations, review	Ch. 2.5	B-2-24, B-2-25
Week 3	Modeling of Mechanical Systems	Ch. 3.1-3.3	B-3-7, B-3-8, B-3-10, B-3-12, B-3-13, B-3-14
Week 4	Mechanical Systems: Work, Energy, Energy Method	Ch. 3.4	B-3-12 (energy method) B-3-17, B-3-20
Week 5	Review **Mid-Term Exam I**		
Week 6	Block Diagrams , Transfer Functions	Ch. 4	B-4-1, B-4-3, B-4-13, B-4-16
Week 7	Electrical Systems Electromechanical Systems	Ch. 6.1-6.3, 6.5	B-6-4, B-6-9, B-6-11, B-6-19
Week 8	Transient Response Analysis	Ch. 8.1-3	B-8-4, B-8-7
Week 9	Impulse Response	Ch. 8.3	B-8-10, B-8-11
Week 10	Analysis in Frequency Domain, Frequency Response, Vibration Isolation	Ch. 9.1-4	B-9-4, B-9-1 B-9-7
Week 11	Vibration Isolation (contd.) Review	Ch. 9.4-5	B-9-9, B-9-10
Week 12	**Mid-Term Exam II** Control Systems, Introduction	Ch. 10.1	B-10-1
Week 13	Control Systems, Automatic Controllers	Ch. 10.1-3	B-10-5
Week 14	Transient Response Analysis System Response Specification	Ch. 10.4-5	B-10-8, B-10-10 B-10-9, B-10-11

Note: All grading metrics and assigned homework problems are at the discretion of the individual instructor. Additional problems may be assigned. Also read related solved problems (A-x-x) in the textbook.

"Dr. Fischer's section will differ slightly from the above."

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