# ME 330 Analysis of Dynamic System

Instructor: Woosoon Yim Office: TBE A219 Ext.: x5 0956 email:<u>woosoon.yim@unlv.edu</u> Text: Modeling & Analysis of Dynamic System by Close et al, 3<sup>rd</sup> ed., Wiley 11:30-1:45 MW, **TBE B172** Grading: 2 Exams (55 %) H.W (10%) Final (35%) All HW assignment is due on Monday class and solution will be posted on <u>http://www.me.unlv.edu/~wy/meg330/hw\_sol/</u> Office Hour: M through TH 9:00-11:00 AM

## Course Description (2008-2010 Catalog):

Mathematical modeling and analysis of dynamic systems with mechanical, electrical, and fluid elements. Topics include: time and frequency domain solution, state space modeling and solutions, linearization, numerical solution using Matlab.

### Prerequisite Course: MATH 431, ME 242

**Prerequisite by Topic:** 

- Dynamics
- Differential equation

**Textbook:** Modeling & Analysis of Dynamic System by Close et al, 3rd ed., Wiley

### **Course learning outcomes:**

- Model the dynamic system in either input/output equation or state space representation.
- Linearize the nonlinear elements in the dynamic system about operating conditions.
- Understand the transient and steady state response of dynamic systems and the effects of the system parameters changes on the responses.
- Simulate the dynamic response using Matlab and Simulink.

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Date	Topic	
1/19(W)	Introduction	chap 1
1/24 (M)	Translational mechanical system	chap 2
1/26(W)	Translational mechanical system	
1/31(M)	State variable representation, I/O equation	chap 3
2/2(W)	Matrix formulation	
1/7(M)	Rotational mechanical system	chap 5
2/9(W)	Complex system	
2/14(M)	Electrical system	chap 6
2/16(W)	Standard form for complex system	chap 5
2/21 (M)	Washington's Birthday Recess	
2/23(W)	Exam I	
2/28(M)	Discussion of Exam I	
3/2(W)	Laplace transform	chap 7
3/7(M)	Transform of functions	
3/9(W)	Transform properties	
	( Mid Semester)	
3/14 - 3/18	Spring Break	
3/21(M)	Transform solution of linear model	
3/23(W)	Transfer function analysis	chap 8
3/28(M)	Zero-input response	
3/30(W)	Zero-state response	
4/4(M)	Frequency response	
4/6 (W)	Linearization of nonlinear system	chap 9
4/11(M)	Exam II	
4/13(W)	Discussion of Exam II	
4/18(M)	Graphical approach: Series expansion	
4/20(W)	Linearization of model	
4/25(M)	Electromechanical system	
4/27(W)	Computer simulation technique of dynamic system	
5/2, 5/4	Study Week	

5/11 Wednesday 10:10 A.M.-12:10 P.M. Final Exam covers all course material (Closed Book)