

Syllabus

(2012 / Spring)

Course No.	3	Sub. No.	2	Course Name	System analysis in Mechanical & Aerospace Engineering	Unit	3
Lecturer	Name : Dongjun Lee, Assistant Professor			Homepage : http://inrol.snu.ac.kr			
	E-mail : djlee@snu.ac.kr			Telephone : 02-880-7114			
	Office hour: Tu/Th 4:00-5:05pm or by appointment (office: 301-1203)						
1. Goal	<ul style="list-style-type: none"> - able to develop mathematical models of simple mechanical, electrical and mechatronic systems - able to analyze and predict system behavior in s, time, and frequency domains - able to design and analyze simple feedback control system 						
2. Textbook and references	<ul style="list-style-type: none"> - Main text: W. J. Palm III, System Dynamics, 2nd edition, McGraw-Hill - References: 1) K. Ogata, System Dynamics, Prentice Hall 2) S. H. Crandall et al, Dynamics of Mechanical & Electromechanical Systems, Krieger Publication 						
3. Evaluation	quiz	homework	mid exam	final exam			Total
	15	10	35	40			100%
	- One mid-term exam and one final exam will be given; date, time & location: TBA						
4. Schedule	week	Tentative Schedule					
	1	Introduction & motivation					
	2	Laplace transform, transfer functions					
	3	Mechanical system (spring element, preload, energy/Rayleigh methods, connections, etc)					
	4	Mechanical system (damper, impulse, modeling examples)					
	5	Electrical system (LRC circuits, op-amp, impedance/admittance)					
	6	Dc motors, mechatronic system examples					
	7	s-domain and time response (pole, zero, step response, parameter estimation, etc)					
	8	s-domain and time response (damping effect, resonance, settling time, etc)					
	9	Simple feedback control					
	10	Frequency response (concept, Bode plot, resonance, damping effect)					
	11	Frequency response (applications: transmissibility, beating, bandwidth, etc)					
	12	Lagrangian dynamics (generalized coordinates, virtual work, potential energy)					
	13	Lagrangian dynamics (Hamilton's principle, Lagrange equation)					
	14	State space (formulation, stability)					
15	Review/final						
5. Notice	<ul style="list-style-type: none"> - TA session will teach (important) MatLab/SimuLink and solve problem sets (time & place: TBA) - Attendance is mandatory: more than or equal to 5 unjustified absences = F grade; one absence (or more than 15 min tardiness) = -2 points; one tardiness (i.e., < 15 min tardiness) = -1 point - HW will be graded 0/0.5/1.0 from 0-1 scale; HW should be turned in at the beginning of the lecture on the due date; if turned in late but on the same day = -50%; otherwise = 0% - You are expected to behave professionally in the class: going-in/out during the class, phone call, texting, or any other unprofessional behaviors are now allowed. 						
6. Process of cheating act	Any form of academic dishonesty is strictly prohibited in this course and, if caught, may result in F-grade and academic disciplinary actions.						