2019   1

Course Title	( )		( )	Mechanical Vibration

( ) Lecturer	( )		/ / (Course No. /)	006891/ /3
(/HP) Contact No.			/ (Class Hour/Venue)	/ 09:00~10:30
(Course Prerequisite)	Enginering Mathematics, Dynamics		(Target Student)	Mechanical Engineering Junior
E-mail (E-mail Address)			/Office Hour (Office/Office Hour)	1114, Tue/Thr 16:30-18:00

(Objectives)	Vibration phenomenon of mechanical systems will be covered in this class. To obtain in-depth understanding of vibration phenomenon of the mechanical system through the lectures on the mathematical expression and analysis of vibration pheonomenon, degree of freedom, resonance, concept of damping, free vibration, system response to specific input, vibration control and design, multi-degree of freedom system and continuous system vibration
(Competencies related to this course)	☐ (Logical and Critical Thinking) ☐ (Creative and Convergent Thinking) ☐ (Self-management Competency) ☐ (Problem Solving Competency) ☐ (Communication Competency) ☐ (Global Competency) ☐ (Community Competency)
CQI (Continuous Quality Improvement Plan)	FFT
(Text book)	main text: Daniel J. Inman, Engineering Vibrations (4nd edition), Prentice Hall. reference: Singiresu S. Rao, Mechanical Vibrations (4th ed.), Prentice Hall.
(Assignment book)	Daniel J. Inman, Engineering Vibrations (2nd edition), Prentice Hall.
(Assignment)	homework problems with which main topics would be understood and reinforced will be given. homework problems are due in one week after given 1. Free Response 2. Matlab/Simulink simulation 3. Harmonic Excitation 4. General Forced Response 5. Multi-degree of Freedom System Response
(Course Grading)	[ ] (%) : 40, (%) : 40, (%) : 10, (%) : 10, midterm(40 %), final(40 %), homework(10 %), attendance(10 %)

(:   )

(Week)	(Course Contents)	(Etc.)	
1	Introduction to vibration, Course overview Review of Dynamics (Equation of motion)	blackboard & projector	
2	One Degree-of-Freedom System Free Response(Equilibrium, Free undamped response) One Degree-of-Freedom System Free Response(free undamped response)	blackboard & projector	
3	One Degree-of-Freedom System Free Response(damping, free damped response) One Degree-of-Freedom System Free Response(Energy method)	blackboard & projector	
4	One Degree-of-Freedom System (stiffness) One Degree-of-Freedom System (measurements)	blackboard & projector	
5	Matlab / Simulink / Computer simulation Matlab / Simulink / Computer simulation, Nonlinear vibration system, stability	blackboard & projector	
6	Response to Harmonic Excitation (harmonic response, frequency response to harmonic input) Response to Harmonic Excitation (Base excitation)	blackboard & projector	
7	Response to Harmonic Excitation (Base excitation, rotating unbalance) Response to Harmonic Excitation (measurement device) & review	blackboard & projector	
8	Review midterm exam		

(:)

(Week)	(Course Contents)	(Etc.)	
9	General Forced Response (impulse response) General Forced Response (response to arbitrary input)	blackboard & projector	
10	General Forced Response (Fourier series, response to an arbitrary periodic input)	blackboard & projector	
11	Laplace transform	blackboard & projector	
12	Multiple-Degree-Of-Freedom System (Eigenvalue problem, free undamped n-DOF system)	blackboard & projector	
13	Diagonalization Modal analysis	blackboard & projector	
14	Modal analysis Multi DOF forced response with viscous damping	blackboard & projector	
15	Lagrange Equation	blackboard & projector	
16	Review final exam		

	( ) , ,
	Students who require special assistance (including special needs students) may contact their professors during the first week of the semester to discuss issues related to attendance, lectures, assignments and exams and request learning assistance.
1 (Additional Guide1)	
2 (Additional Guide2)	

( ) .