

Republic of Iraq
The Ministry Of Higher Education
& Scientific Research



University: Diyala
College: Engineering
Department:Mechanic
Stage: Fourth
Lecturer name: Ekhlas Edan Kader
Qualification: PhD
Place of work: University of Diyala

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Course Instructor	Ekhlas Edan Kader				
E-mail	eng_ekhlas@yahoo.com				
Title	Structural vibration				
Course Coordinator	Annually				
Course Objective	1-Study mechanical vibration by studying type of motion ,frequency and natural frequency. 2-Have a basic information about how to find natural frequency using many methods(newton ,Rayleigh,energy and lagrange method) 3-Use equation of motion to find mode shape and coupling of coordinates in two dimensional motion 4-Use eigen value and eigen vector to find equation of motion and natural frequency 5-Study forced vibration (rotating unbalance ,friction and base exitation .				
Course Description	Have a basic information about the subject and be able to solve elementary problems. It will be fully described by the lecture description listed in Course Weekly Outline				
Textbook	-Structural dynamics and vibration in practice By Douglass Thorby -Mechanical vibration/theory and application By s. Graham Kelly -Theory of vibration with applications By William t. Thomson				
Course Assessments	Term Tests	Laboratory	Quizzes	Project	Final Exam
	20	/	10	10	60
General Notes					

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Course Weekly Outline

Week	Topes Covered
1	Basic concepts and mechanical vibration terminology.
2	Simple harmonic motion-degrees of freedom.
3	Elements of vibration, mass, spring and dashpot.
4	Damping, definition, viscous damping.
5	Undamped free vibration, Application of Newton second law to find natural frequency.
6	Energy method.
7	Rayleigh method.
8	Damped free vibration of single degree of freedom system , damping ratio.
9	Logarithmic decrement and tutorial problems.
10	Torsional systems.
11	Forced vibration, introduction and terminologies.
12	Problems on forced vibration.
13	Study of reciprocating and Rotating imbalance.
14	Concepts of base excitation.
15	First term exam.
16	Vibrating system under coulomb damping Vibration isolation and problems.

Half – year	
17	Transmissibility , definition and force Transmissibility
18	Vibration measuring instruments
19	Tutorial problems
21	Two degree of freedom ,translational systems
21	Torsional systems
22	Coordinate coupling and principle coordinate
23	Damped free vibration
24	Forced vibrations of undamped systems
25	Forced vibrations with damping
26	Dynamic vibration absorber
27	Lagrange equation
28	Eigen value and eigen vector
29	Multi-degree of freedom of undamped systems
30	Natural frequency and mode shape, Multi-degree of freedom of damped systems

INSTRUCTOR Signature:

Dean Signature: