Date:	Examination No.:	Version:2022-2023	Start:4/9/2022
Module Name - Code	Theory of Vibrations-3117		
Module Language:	English		
Responsible:	Dr. Shirin Othman Muhammad		
Lecture (s):	Dr. Shirin Othman Muhammad		
College:	College of Engineering – Salahaddin University-Erbil		
Duration:	15 week – 1 semester		
Course outcomes:	At the end of the semester, students would be able to understand the characteristics of undamped and damped free and forced vibrations and the role of resonance in the design of mechanical systems. Analyze and solve free and forced vibration responses of two and multi-degree-of-freedom systems with emphasis on minimizing or absorbing vibration.		
Course Content:	Introduction to Vibration Systems, free and forced vibration analysis for undamped and damped single degree of freedom systems. Natural frequency calculation for translational and torsional systems. Coulomb damping, rotating unbalance, support motion, vibration absorption and vibration isolation systems.		
Literature:	S. S.Rao " Mechanical Vibration". - William Thomson" Theory of vibration with applications"		
Type of Teaching:	Two forms of teaching are generally used: power point using data-show and white board for deriving and solving problems. Students will be participated in solving problems, group discussions are allowed in lectures.		
Pre-requisites:	None		
Preparation Modules:	Students must have background about strength of materials, thermodynamics, and dynamics.		
Frequency:	Every year		
Requirements for credit points:	For the award of credit points, it is necessary to pass the module exams. It contains: Midterm examination, Lab Reports, Quizzes and Final examination. **Student's attendance is required in all classes**. **Students with more than 15% absent records and/or student effort less than 20% are not allowed to enter the final exam.** **Lab reports will not be accepted for those not attending the lab sessions.**		
Credit point:	5		

Grade Distribution:	The following grade system is used for the evaluation of the module exam: The module exam is based on the summation of two categories of evaluations: **First: (40%)** of the mark is based on the academic semester effort which includes - Midterm examination during the academic semester =17%. - Assignment, quiz and homework = (8%). - practical part: includes writing report with discussion about studied experiments (15%) **Second: (60%)** of the mark is based on final examination that is comprehensive for the whole of the study materials reviewed during the academic semester. Theoretical exam 50%. Practical exam 10%
Work load:	The workload is 135 hrs. It is the result of 90 hrs. attendance and 45 hrs. self-studies (Assignments, preparation for exam and applications).

Details of lectures per weeks of the academic semester

Week No.	Date	Theoretical Lectures details
1	5/9	Module description+ Introduction to vibrations
2	12/9	Introduction to mechanical vibration+ free vibration analysis on single degree of freedom systems (undamped, Newton's method)
3	19/9	Free vibration analysis on single degree of freedom systems (undamped, energy method)
4	26/9	Solving problems on both cases+ free vibration analysis on single degree of freedom systems (damped)
5	3/10	Quiz 1+ continuing free vibration analysis on single degree of freedom systems (damped)
6	10/10	Solving problems+ forced vibration analysis on single degree of freedom systems (undamped)
7	17/10	Solving problems+ forced vibration analysis on single degree of freedom systems (damped)
8	24/10	Solving problems+ Quiz2
9	31/10	Continuous exam 1+ Coulomb damping
10	7/11	Solving problems+ rotating unbalance
11	14/11	Quiz 3+ support motion
12	21/11	Solving problems + vibration absorption systems
13	28/11	Multi-degree of freedom systems (free vibration analysis, undamped)
14	5/12	Multi-degree of freedom systems (free vibration analysis, damped)
15	12/12	Solving problems+ continuous exam 2