

The University of Jordan
School of Engineering



Department	Course Name		Course Number	Semester
Mechanical Engineering	Non-Linear Vibrations		0904919	
2025 Course Catalog Description				
Vibrations of non-linear single-degree-of-freedom systems; Singular points; Liapunoff function; Approximation techniques used in nonlinear vibration; Perturbation theory for the eigenvalue problem; Stability; Self-excited vibrations; Vibrations of non-linear multi-degree-of-freedom systems;bifurcations and chaos in dynamical systems. For simulation and analysis, this course will use computer programming such as MAPLE and MATLAB.				
Instructors				
Name	E-mail	Section	Office Hours	Lecture Time
Prerequisites				
Prerequisites by topic				
Prerequisites by course				
Co-requisites by course				
Prerequisite for				
Topics Covered				
Week	Topics			
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
Evaluation				
Assessment Tools		Expected Due Date		Weight

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Contribution of Course to Meet the Professional Components									
Relationship to Student Outcomes									
SOs	1	2	3	4	5	6	7		
Availability									
Relationship to Aeronautical Engineering Program Objectives (AEPOs)									
AEPO1		AEPO2		AEPO3		AEPO4		AEPO5	
ABET Student Outcomes (SOs)									
1	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics								
2	An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors								
3	An ability to communicate effectively with a range of audiences								
4	An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts								
5	An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives								
6	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions								
7	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies								
Updated by ABET Committee, 2025									