FUTURE UNIVERSITY IN EGYPT جامعة المستقبل

Faculty of Engineering & Technology

Vibration Principles and Monitoring

Information :

Course Code :	MKT 510	**Level :**	Undergraduate	**Course Hours :**	2.00- Hours

Department : Specialization of Mechatronics Engineering

Instructor Information :

Title	Name	Office hours
Professor	Hassan Ahmed Ahmed Mohamed Metered	2
Teaching Assistant	Osama Ahmed Ibrahim Mohamed Montaser	

Area Of Study :

Gain a through introduction to mechanical vibration of single and multi-degree of freedom systems.
Enrich the student's knowledge about techniques of machinery vibration control.
Introduce the processes of monitoring operating conditions of industrial machinery and its relevance to fault detection and diagnosis.

Description :

Introduction to Vibration Principles, Fault detection techniques, Vibration as a Fault detection and diagnosis technique, Vibration Measurements and analysis, use of Vibration as a machinery condition monitoring.

Course outcomes :

a.Knowledge and Understanding: :	
1 -	Identify fundamentals of vibration analysis and control of mechanical systems.
2 -	Describe vibration isolation techniques for mechanical systems
3 -	Explain machinery vibration monitoring, and mechanical systems fault diagnosis.
b.Intellectual Skills: :	
1 -	Develop mathematical models for dynamic systems.
2 -	Analyse vibration response of single and multi-degree of freedom systems
3 -	Relate vibration response analysis to machine condition monitoring and fault diagnosis and use available software packages.
c.Professional and Practical Skills: :	
1 -	Perform experimental measurement for vibration isolation and control considering the safety precautions.
2 -	Analyse recorded data of vibration testing.
3 -	Prepare technical report for vibration control experimental work.
4 -	Construct response curves of tested vibration control systems.

d.General and Transferable Skills: :	
1 -	Work in stressful environment and within constrains through assignments and term papers.
2 -	Communicate effectively through technical reports and representations.
3 -	Search for information and engage in life-long self-learning discipline through self-study tasks.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Introduction to vibration as a machine condition monitoring.		2	0
Vibration analysis of damped and undamped single and multi-degree of freedom systems		8	4
Vibration transmission and isolating foundation design, vibration control techniques.		6	3
Characteristics of vibration signals and frequency analysis.		4	2
Vibration as a machine condition monitoring and fault diagnosis.		4	3

Teaching And Learning Methodologies :

Interactive Lecturing
Problem solving
Discussion
Experiential Learning
Term Paper
Research

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Assignments, Participation, & Quizzes	20.00		
Final Exam	40.00	16	
First Midterm Exam	15.00	5	
Second Midterm Exam	15.00	10	
Term Paper (SelfStudy)	10.00		

Course Notes :

Lecture notes on the course Moodle page, FUE website.

Recommended books :

"Engineering Vibration" By: Daniel J. Inman, 3rd ed., Prentice-Hall Inc., (ISBN: 0132281732) (2002).
"Vibration Condition Monitoring of Machines) By: J.S. Rao, CRC Press, (ISBN: 0849309379) (2000)
"Machinery Vibration Analysis and Predictive Maintenance", By: Cornelius Scheffer, and Paresh Girdhar, Elsevier ISBN: 978-0-7506-6275-8) (2004).