Course Title	Course Code:	Credit Hours:
Structural Dynamics	AE-464	3-0

Textbooks:

- Singiresu S. Rao, Fook Fah Yap , “Mechanical Vibrations”, Prentice Hall
- Francis S. Tse, Rolland T. Hinkle, Ivan E. Morse , “Mechanical Vibration Theory & Application”, CBS Publishers & Distributors

Reference Book/Material:

- T.H.G. Megson, “Aircraft Structures for Engineering Students”, Elsevier Science
- Source https://www.hec.gov.pk/english/services/universities/RevisedCurricula/Documents/2011-2012/Aerospace-2011-12.pdf

Course Objective(s):

This course aims to equip students with a comprehensive understanding of structural dynamics, focusing on analyzing and predicting the vibrational behavior of structures. Students will learn to evaluate the impact of dynamic loads on structural integrity and performance. Practical applications in designing resilient aerospace and engineering structures will also be emphasized.

Course Outline:

- Fundamentals of Vibration Analysis
- Discrete and Continuous Vibration Systems
- Free Vibratory Single Degree of Freedom
- Forced Vibratory Single Degree of Freedom
- Harmonic Vibration Analysis Techniques
- Rotating Unbalance Effects On Structures
- Base Excitation and Its Impact
- Vibration Isolation Methods and Strategies
- Transient Vibration and Its Analysis
- Two Degrees of Freedom Systems

- Multi-Degree of Freedom System Analysis
- Dynamic Response of Engineering Structures
- Introduction to Aero-Elasticity Concepts
- Aero-Elasticity in Aerospace Vehicles