

AE-688
DYNAMICS AND VIBRATION

L-T-P-D: 3-0-0-0

Units: 4

Course Instructor: Dr. PM Mohite

Office: AE-11

Ph: 6024

Email: mohite@iitk.ac.in

<http://home.iitk.ac.in/~mohite/ae688.html>

Course Content:

- Rigid body dynamics: Newton's second law, impulse and momentum, moment of a force, and angular momentum, work and energy, system of particles, rigid bodies, Euler's equations.
- Analytical mechanics: Degrees of freedom, generalized coordinates, virtual work, Hamilton's principle, Lagrange's equations.
- Linear system theory: Frequency response, transform methods, transfer function, transition matrix, Eigen value problem, Modal analysis.
- Lumped parameter systems: Single degree of freedom system, two degrees of freedom system, multiple degrees of freedom system.
- Continuous system: Introduction, longitudinal, transverse and torsional vibrations of slender members.

Reference:

1. Engineering Mechanics: Dynamics. JL Meriam, LG Kraige (4th Edition), Wiley.
2. Engineering Mechanics: Static and Dynamics. Irving H. Shames (4th Edition), Prentice Hall.
3. Theory of Vibration with Applications. WT Thomson, MD Dahlen (5th Edition) Pearson Education.
4. Fundamentals of Vibrations. L Meirovitch (Mc Graw Hill Intl. Edition).
5. Any other relevant book

Examination:

Mid Sem I + II: 20% each,
Assignments + Quiz: 10%
End Sem: 50%

Note:

- Assignments should be submitted on the due date. Late submission and copying of assignments will be penalized.
- Attendance is compulsory. The attendance will be monitored regularly.

Class schedule: As per given time table

Grading Policy: Below absolute 40% implies failure! Relative grading after that.