Date:13/01/2016

In addition to Part–I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course No   : ME F343
Course Title   : Mechanical Vibration
Instructor-in-charge : Arun Kumar Jalan

1. Course Description:

Small oscillations of linear dynamical systems, free and forced vibrations of single and multi degree-of-freedom systems, normal modes and orthogonality relations, generalized co-ordinates and Lagrange's equations, matrix formulation, eigen-value problem and numerical solutions, transient response of one-dimensional systems, approximate energy methods, continuous system, vibration of string, rods, bars and beams. Introduction to control systems.

2. Course Material

Text Book:

T1:   *"Theory of Vibration with Application"*, Thomson W. T., Dahleh M. D., Pearson Education, 5th Ed.

Reference Books:

R1:   "*Mechanical Vibration", S S Rao,* Pearson Education, 4th Ed

R2:   "*Mechanical Vibrations - Theory and Application*", Tse F.S., Morse I.E., Hinkle R.T., Allyn and Bacon Inc. London, 1983.

3.   Course Plan:

Lect. No.	Objectives	Topics to be covered	Chapter
1	Introduction to Oscillatory Motion	Basic Terminology	T1-CH1
2-4	Free Vibrations	Vibration Models, Natural Frequency, Damped Free Vibrations, Logarithmic Decrement, Coulomb Damping	T1-CH2
5-10	Forced Vibration	Harmonic Excitations, Rotating Unbalance, Support motion, Whirling, vibration isolation	T1-CH3
11-12	Transient Vibration of SDOF	Impulse and arbitrary excitation	T1-CH4
13-15	Energy based Approaches	Energy method, Lagrange's equation	T1-CH6
16-20	System with Multi degree of freedom	Modal analysis, Coupling co-ordinates, Vibration absorber	T1-CH5

21-24	Properties of vibrating systems	Flexibility influence Co-efficient, Reciprocity Theorem, stiffness influence co-efficient, Orthogonality of eigenvectors	T2-CH 11
25-29	Vibration of continuous system	String, Rods, Beams	T1- CH7
30-34	Continuous system: Approximate and exact solution	Rayleigh's method, Rayleigh-Ritz method, Dunkerley's equation, Holzer's method,	T1- CH10
35-36	Introduction to Control system	Basic Introduction	Class notes

4. Evaluation Scheme:

Evaluation Components	Duration (min.)	Weightage (%)	Marks	Date and time	Remarks
Mid-sem	90	25	50	**15/3 9:00 - 10:30 AM**	CB+OB
Quiz	-	10	20		--
Assignment		10	20		
Tutorial	50	15	30		CB+OB
Compre. Exam	180	40	80	**5/5 FN**	CB+OB
TOTAL			200		

5. Tutorial : Out of four evaluative tutorials best three will be considered for final evaluation.

6. Chamber Consultation Hour: Tuesday 3.30 pm to 4.30 pm Chamber no: **2152-C**

7. Notices: Notice, if any, concerning the course will be displayed on the Notice Board of ME Department

Instructor-In-Charge
ME F343