# Lesson Plan

Name of Institute              : Ambala College of Engineering and Applied Research
Name of the Faculty member  : Satbir Singh
Discipline                       : Mechanical Engineering
Semester                     : 6th
Subject                       : Tribology &Mechanical Vibration (ME-304 N)
Lesson Plan Duration       : 15 weeks (from January 2020 to April 2020)
Work Load                   :   L   T   P

| Week | Theory | | Practical | |
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| | Lecture day | Topic (including assignment/ test) | Practical day | Topic |
| 1st | 1 | Elements of a vibratory system | 1 | To determine the radius of gyration of a simple pendulum |
| | 2 | S.H.M , Degrees of freedom, Types of vibrations | | |
| | 3 | Work done by a harmonic force | | |
| 2nd | 4 | Beats | 2 | To determine the radius of gyration of a compound pendulum |
| | 5 | Undamped free vibrations | | |
| | 6 | Natural frequency by equilibrium | | |
| 3rd | 7 | Energy methods for solving problems | 3 | To determine the radius of gyration of given bar using bifilar suspension |
| | 8 | Equivalent spring & linear systems | | |
| | 9 | Torsional systems | | |
| 4th | 10 | Simple & compound pendulum | 4 | Viva- Voce |
| | 11 | Bifilar and Trifilar suspensions | | |
| | 12 | Forced Vibrations, Sources of excitation | | |
| 5th | 13 | Equations of motion with harmonic force | 5 | To study undamped free vibrations of equivalent spring mass system and determine the natural frequency. |
| | 14 | Response of rotating unbalanced system | | |
| | 15 | Response of reciprocating unbalanced system | | |
| 6th | 16 | Revision/Numerical Practice | 6 | |
| | 17 | Revision/Numerical Practice | | |
| | 18 | Sessional- I | | |
| 7th | 19 | Support motion & Vibration Isolation | 7 | To study the torsional vibration of a single rotor shaft system and determine the natural frequency |
| | 20 | Force and Motion transmissibility | | |
| | 21 | Forced vibrations with coloumb damping | | |
| 8th | 22 | Structural damping and viscous dampings. | 8 | To study the forced vibration of system with damping. Load magnification factor vs. Frequency and phase angle vs frequency curves. Also determine the damping factor. |
| | 23 | Multi-degree of freedom systems, Principle modes of vibrations | | |
| | 24 | Influence co-efficient | | |
| 9th | 25 | Matrix method, orthogonality principle | 9 | Viva- Voce |
| | 26 | Dunkerleys equation, Matrix iteration method | | |
| | 27 | Holzer Method, Rayleigh Method | | |
| 10th | 28 | Rayleigh-Ritz methods, Stodola method | 10 | |
| | 29 | Hamilton principle, Numerical Practice | | |
| | 30 | Sessional-II | | |
| 11th | 31 | Transverse vibrations of strings | 11 | To study the free |

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| | 32 | Longitudinal Vibrations of bars | | vibration of system for different damper settings. Draw decay curve and determine the log decrement and damping factor. Find also the natural frequency |
| | 33 | Lateral vibration of beams | | |
| 12th | 34 | Torsional vibration of circular shafts | 12 | To evaluate the wear and extreme pressure properties of a lubricating oil by using four ball tester. |
| | 35 | Tribology in design, Tribology in industry | | |
| | 36 | economic aspects of Tribology, modes of lubrication, lubricants, properties of lubricants | | |
| 13th | 37 | Types of additives, extreme pressure lubricants, recycling of used oils | 13 | Viva-Voce |
| | 38 | Oil conservation, disposal of scrap oil, oil emulsion | | |
| | 39 | laws of friction, kinds of friction, causes of friction | | |
| 14th | 40 | friction measurement, theories of friction | 14 | |
| | 41 | Effect of surface preparation. Introduction to Wear, Types of wear | | |
| | 42 | various factors affecting wear, measurement of wear, wear between solids and liquids | | |
| 15th | 43 | Theories of wear | 15 | |
| | 44 | Numerical Practice | | |
| | 45 | Sessional-III | | |

(Signature of the teacher concerned with date)