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| 1. | Title of the course | Vibrations of Continuous Systems |
| 2. | Course number | ME603L |
| 3. | Structure of credits | 3-0-0-3 |
| 4. | Offered to | PG |
| 5. | New course/modification to | Modification To ME6022/10 |
| 6. | To be offered by | Department of Mechanical Engineering |
| 7. | To take effect from | January 2022 |
| 8. | Prerequisite | CoT for PG |
| 9. | **Course Objective(s):** To estimate the vibration response of the dynamical systems by considering them to be continuous. To mathematically model and analyse the vibrations of continuous systems such as strings, bars, shafts, membranes and plates using exact and approximate methods. | |
| 10. | **Course Content:** Overview of modelling of discrete systems; 1D systems, strings, bars, beams; 2D systems, plates; Modal analysis, separation of variables, eigensolutions, various boundary conditions (geometric, natural, and mixed boundary conditions), orthogonality of modes, modal synthesis; Vibration response, free response (initial value problem), Forced response (distributed and concentrated forces); Green's function, time-dependent boundary conditions; Frequency-domain formulation; Approximate method, finite element formulations, numerical solutions | |
| 11. | **Textbook(s):**<br>1. Meirovitch L, *Fundamentals of Vibrations*, McGraw-Hill (2010).<br>2. Rao S S, *Vibration of Continuous Systems*, Wiley (2007). | |
| 12. | **Reference(s):**<br>1. Hartog J P D, *Mechanical Vibrations*, Crastre Press (2008). | |