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| **Course code** | **Course Title** | **Core/ Elective** | | | | | |
| 2ES202CE | ENGINEERING MECHANICS-2 | Core | | | | | |
| L | T | P/D | Credits | CIE | SEE |
| 3 | 0 | 0 | 3 | 40 | 60 |
| **Prerequisite:** Engineering Mechanics 1  **Course Objectives:** The objective of this course is to make the student   * Kinematics of rigid bodies modelled as particles: Rectilinear and curvilinear motion * Concepts of dynamic equilibrium and applications to problems on dynamic motion of rigid bodies * Work-energy principle for solving unknown kinematic and dynamic parameters in rigid body motion. * Impulse and Momentum principle to solve problems involving collisions * Concepts of simple harmonic motion and mechanical vibration   **Course Outcomes:**  After completion of the course, the student will be able to   * **CO.1** **Solve** for the kinematic parameters of rectilinear and curvilinear translations of rigid bodies modelled as particles * **CO.2** **Solve** for the unknown forces and kinetic parameters for particles and connected bodies using dynamic equilibrium equations * **CO.3** **Apply** the work-energy principle for solving problems on dynamics for particles and connected bodies * **CO.4** **Apply** the linear impulse momentum principle for the problems involving impact and collisions of rigid bodies * **CO.5** **Formulate** dynamic equations and **solve** for unknown parameters in simple harmonic motion of solid bodies | | | | | | | |
| **Unit-I: (10 Hrs**)  **Kinematics:** Rectilinear and curvilinear translation (uniform and variable acceleration). Rectangular, normal and tangential components of acceleration.  **Unit-II: (10 Hrs)**  **Kinetics:** General Principles of kinetics, D’ Alembert’s principle and its application to particle motion, angle of banking and connected bodies.  **Unit-III: (06 Hrs)**  **Work-Energy Method:** Work done by a force and kinetic energy of a particle. Equation of work energy for translation - applied to particle motion and connected bodies.  **Unit-IV: (08 Hrs)**  **Impulse and Momentum:** Introduction to linear impulse-momentum, principle of conservation of linear momentum and its applications. Elastic impact and coefficient of restitution.  **Unit-V: (06 Hrs)**  **Mechanical Vibrations:** Introduction, amplitude, time period, frequency, simple harmonic motion, free vibrations, simple pendulum | | | | | | | |
| **T Text Books**  T1. Engineering Mechanics: Principles of Statics and Dynamics, R. C. Hibbler, Pearson Education; Fourteenth edition, 2017  T2. Engineering Mechanics S.S. Bhavikatti et al, New Age International Publishers, 2017 (Unit 1-5)  **References/ Suggested Reading**  R1. Engineering Mechanics (In SI Units), by S.P. Timoshenko, D.H. Young, J.V. Rao, Sukumar Pati, McGraw Hill International, 5th edition, 2017  R2. A Textbook of Engineering Mechanics, R.S. Khurmi and N. Khurmi, S. Chand Publications, 22nd Edition, 2018 (Unit1-5)  R3. Engineering Mechanics - Statics and Dynamics, by N H Dubey, McGraw Hill Education, 2017  R4. Singer's Engineering Mechanics Statics and Dynamics, by K. Vijay Kumar Reddy and J. Suresh Kumar, B.S. Publishers, 2011  R5. Engineering Mechanics Statics and Dynamics, A. K. Tayal, 14th Edition, Umesh Publishers, 2010. | | | | | | | |