**LESSON PLAN**

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| **Discipline:**  All Branches | **Semester:**  Second(2nd ) | **Name Of The Faculty:** Er. L. Mohapatra , Er. Sangram Behuria & Er Qumar Aziz |
| **Subject:**  Engineering Mechanics(Th-04) | **No of days/ week**  **class allotted:**  Six(6) | **Semester from date:** 29.01.2024 **to Date:** 14.05.2024  **No of weeks: 15** |
| **WEEK** | **CLASS DAY** | **THEORY TOPICS** |
| 1st | 1st | **Chapter No.- 01 (Fundamentals of Engineering Mechanics)**  Introduction to Engineering Mechanics |
| 2nd | Fundamentals. Definitions of Mechanics, Statics, Dynamics, Rigid Bodies |
| 3rd | Force. Force System. Definition, Classification of force system according to plane & line of action. |
| 4th | Characteristics of Force & effect of Force. |
| 5th | Principles of Transmissibility & Principles of Superposition. Action & Reaction Forces & concept of Free Body Diagram |
| 6th | Resolution of a Force. Definition, Method of Resolution, Types of Component forces, Perpendicular components & non-perpendicular components. |
| 2nd | 1st | Composition of Forces. Definition, Resultant Force, Method of composition of forces |
| 2nd | Analytical Method such as Law of Parallelogram of forces |
| 3rd | Solving Numerical |
| 4th | Solving Numerical |
| 5th | Method of resolution -Solving Numerical |
| 6th | Solving Numerical |
| 3rd | 1st | Graphical Method. Introduction, Space diagram, |
| 2nd | Vector diagram, Polygon law of forces |
| 3rd | Resultant of concurrent, non-concurrent & parallel force system by Analytical & Graphical Method. |
| 4th | Solving Numerical |
| 5th | Moment of Force. Definition, Geometrical meaning of moment of a force, measurement of moment of a force & its S.I units. Classification of moments according to direction of rotation, sign convention. |
| 6th | Law of moments, Varignon’s Theorem |
| 4th | 1st | Solving Numerical |
| 2nd | Couple – Definition, S.I. units, measurement of couple, properties of couple. |
| 3rd | Review classes |
| 4th | **Possible question & Answer Discussion** |
| 5th | **Monthly test-01** |
| 6th | **Chapter No.- 02 (Equilibrium)**  Definition, condition of equilibrium, Analytical & Graphical conditions of equilibrium for concurrent, Free Body Diagram. |
| 5th | 1st | Definition, condition of equilibrium, Analytical & Graphical conditions of equilibrium for non-concurrent & Free Body Diagram |
| 2nd | Lami’s Theorem – Statement, Application for solving various engineering problems. |
| 3rd | Solving Numerical |
| 4th | Solving Numerical |
| 5th | Solving Numerical |
| 6th | Review classes |
| 6th | 1st | **Possible question & Answer Discussion** |
| 2nd | **Chapter No.- 03 (Friction)**  Definition of friction, Frictional forces, Limiting frictional force, Coefficient of Friction. |
| 3rd | Angle of Friction & Repose, Laws of Friction, Advantages & Disadvantages of Friction. |
| 4th | Equilibrium of bodies on level plane – Force applied on horizontal & inclined plane (**up** ). |
| 5th | Equilibrium of bodies on level plane – Force applied on horizontal & inclined plane (**down**). |
| 6th | Solving Numerical |
| 7th | 1st | Ladder Friction. |
| 2nd | Solving Numerical |
| 3rd | Wedge Friction. |
| 4th | Solving Numerical |
| 5th | Review classes |
| 6th | **Monthly test-02** |
| 8th | 1st | **Possible question & Answer Discussion** |
| 2nd | **Chapter No.- 04 (Centroid & Moment of Inertia)**  Centroid – Definition, Moment of an area about an axis, centroid of geometrical figures such as squares, rectangles, triangles, |
| 3rd | Centroid – Definition, Moment of an area **circles,** semicircles & quarter circles, centroid of composite figures |
| 4th | Solving Numerical |
| 5th | Solving Numerical |
| 6th | Solving Numerical |
| 9th | 1st | Moment of Inertia – Definition, Parallel axis theorem |
| 2nd | Moment of Inertia –Perpendicular axis Theorems. M.I. of plane lamina |
| 3rd | Moment of Inertia of different engineering sections |
| 4th | Solving Numerical |
| 5th | Solving Numerical |
| 6th | **Monthly test-03** |
| 10th | 1st | Review classes |
| 2nd | **Possible question & Answer Discussion** |
| 3rd | **Chapter No.- 05 (Simple Machines)**  Definition of simple machine, velocity ratio of simple gear train. |
| 4th | Definition of simple machine, velocity ratio of compound gear train. |
| 5th | Explain simple & compound lifting machine, define M.A, V.R. & Efficiency & State the relation between them |
| 6th | State Law of Machine, Reversibility of Machine, Self-Locking Machine |
| 11th | 1st | Solving Numerical |
| 2nd | Solving Numerical |
| 3rd | Study of simple machines – simple axle & wheel |
| 4th | Single purchase crab winch & double purchase crab winch |
| 5th | **Monthly test-04** |
| 6th | Worm & Worm Wheel, Screw Jack |
| 12th | 1st | Types of hoisting machine like derricks etc., their use and working principle. No problems. |
| 2nd | Review classes |
| 3rd | **Possible question & Answer Discussion** |
| 4th | **Chapter No.- 06 (Dynamics)**  Kinematics & Kinetics, Principles of Dynamics, Newton’s Laws of Motion, Motion of Particle acted upon by a constant force |
| 5th | Equations of motion, De-Alembert’s Principle. |
| 6th | Solving Numerical |
| 13th | 1st | Work, Power, Energy & its Engineering Applications, Kinetic & Potential energy & its application |
| 2nd | Momentum & impulse, conservation of energy & linear momentum |
| 3rd | collision of elastic bodies, and Coefficient of Restitution |
| 4th | Solving Numerical |
| 5th | Review classes |
| 6th | **Possible question & Answer Discussion** |
| 14th | 1st | Revision |
| 2nd | Revision |
| 3rd | Revision |
| 4th | Revision |
| 5th | Revision |
| 6th | Revision |
| 15th | 1st | Revision |
| 2nd | Revision |
| 3rd | Revision |
| 4th | Revision |
| 5th | Revision |
| 6th | Revision |