**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 |