**LESSON PLAN**

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| **DISCIPLINE:**  **MECHANICAL ENGINEERING** | **SEMESTER:1st(2021-22)** | **NAME OF THE FACULTY: GOPAL CH. MISHRA** |
| **SUBJECT:**  **ENGINEERING MECHANICS(TH-4)** | **NO. OF DAYS/WEEK CLASS ALLOTTED:**  **4P/WEEK** | **SEMESTER FROM DATE:**  **TO DATE:**  **NO. OF WEEKS: 15** |

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| **Sl No.** | **week** | **CLASS Day** | **Topics to be covered** |
| 1 | 1st | 1st day | Fundamentals. Definitions of Mechanics, Statics. |
| 2nd day | Dynamics, Rigid Bodies |
| 3rd day | Force System. Definition, Classification of force system according to plane & line of action. |
| 4th day | Characteristics of Force & effect of Force. Principles of Transmissibility. |
| 2 | 2nd | 1st day | Principles of Superposition. Action & Reaction Forces |
| 2nd day | concept of Free Body Diagram. |
| 3rd day | Resolution of a Force. Definition, Method of Resolution, Types of Component forces. |
| 4th day | Perpendicular components & non-perpendicular components. |
| 3 | 3rd | 1st day | Resolution of a Force. Definition, Method of Resolution, Types of Component forces, Perpendicular components & non-perpendicular components. |
| 2nd day | Composition of Forces. Definition, Resultant Force, Method of composition of forces. |
| 3rd day | Analytical Method such as Law of Parallelogram of forces & method of resolution. 1.4.2. Graphical Method. Introduction, Space diagram, Vector diagram, Polygon law of forces. |
| 4th day | Resultant of concurrent, non-concurrent & parallel force system by Analytical & Graphical Method. |
| 4 | 4th | 1st day | 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. |
| 2nd day | Law of moments, Varignon’s Theorem, Couple – Definition, S.I. units, measurement of couple, properties of couple. |
| 3rd day | EQUILIBRIUM:  Definition, condition of equilibrium. |
| 4th day | Analytical & Graphical conditions of equilibrium for concurrent forces. |
| 5 | 5th | 1st day | Analytical & Graphical conditions of equilibrium for non- concurrent forces. |
| 2nd day | Free Body Diagram. |
| 3rd day | Lamia’s Theorem. |
| 4th day | Statement and Application of Lami’s theorem. |
| 6 | 6th | 1st day | solving various engineering problems. |
| 2nd day | solving various engineering problems. |
| 3rd day | FRICTION:  Definition of friction, Frictional forces. |
| 4th day | Limiting frictional force, Coefficient of Friction. |
| 7 | 7th | 1st day | Angle of Friction & Repose, Laws of Friction. |
| 2nd day | Advantages & Disadvantages of Friction. |
| 3rd day | Equilibrium of bodies on level plane. |
| 4th day | Force applied on horizontal & inclined plane(UP WARD) |
| 8 | 8th | 1st day | Force applied on horizontal & inclined plane(DOWN WARD) |
| 2nd day | Ladder friction |
| 3rd day | Ladder friction |
| 4th day | Wedge Friction. |
| 9 | 9th | 1st day | CENTROID & MOMENT OF INERTIA:  Centroid – Definition. |
| 2nd day | Moment of an area about an axis. |
| 3rd day | Centroid of geometrical figures such as squares. |
| 4th day | Centroid of rectangles. |
| 10 | 10th | 1st day | Centroid of triangles, circles. |
| 2nd day | Centroid of semicircles & quarter circles. |
| 3rd day | centroid of composite figures. |
| 4th day | Moment of Inertia – Definition. |
| 11 | 11th | 1st day | Parallel axis theorem. |
| 2nd day | Find out M.I of rectangle by parallel axis theorem. |
| 3rd day | Perpendicular axis Theorems. |
| 4th day | Find out M.I of circle by Perpendicular axis Theorems. |
| 12 | 12th | 1st day | M.I. of plane lamina & different engineering sections. |
| 2nd day | M.I. of plane lamina & different engineering sections. |
| 3rd day | SIMPLE MACHINES:  Definition of simple machine, velocity ratio of simple and compound gear train. |
| 4th day | explain simple & compound lifting machine. |
| 13 | 13th | 1st day | Define M.A, V.R. & Efficiency & State the relation between them. |
| 2nd day | State Law of Machine, Reversibility of Machine, Self Locking Machine. |
| 3rd day | Study of simple machines – simple axle & wheel. |
| 4th day | single purchase crab winch & double purchase crab winch. |
| 14 | 14th | 1st day | Worm & Worm Wheel, Screw Jack. |
| 2nd day | Types of hoisting machine like derricks etc, Their use and working principle. No problems. |
| 3rd day | DYNAMICS:  Kinematics & Kinetics, Principles of Dynamics, Newton’s Laws of Motion, Motion of Particle acted upon by a constant force. |
| 4th day | Equations of motion, De-Alembert’s Principle. |
| 15 | 15th | 1st day | Work, Power, Energy & its Engineering Applications. |
| 2nd day | Kinetic & Potential energy & its application. |
| 3rd day | Momentum & impulse, conservation of energy & linear momentum. |
| 4th day | Collision of elastic bodies, and Coefficient of Restitution. |