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| **Govt. Polytechnic Dhangar(Fatehabad)** | | | | |
| **Lesson Plan** | | | | |
| **Name of the Faculty** | | **Mr. Pardeep** | | |
| **Discipline** | | **Mechanical Engineering** | | |
| **Semester** | | **2nd** | | |
| **Subject** | | **Applied Mechanics** | | |
| **Lesson Plan Duration** | | **16Week (from 15 Feb 202 4 to 14 June 2024)** | | |
| **WEEK** | **THEORY** | | **PRACTICAL** | |
| **LECTURE DAY** | **TOPIC** | **PRACTICAL** | **TOPIC** |
| 1 | 1 | Introduction Concept of mechanics, | 1st | 1. Verification of polygon law of forces using universal force table/Gravesend  apparatus. |
| 2 | Classification of mechanics, utility of mechanics in engineering field |
| 3 | Concept of rigid body |
| 2 | 4 | Scalar and vector quantities. | 2nd | 1. Verification of polygon law of forces using universal force table/Gravesend apparatus. |
| 5 | 2. Laws of forces Definition of force, measurement of force in SI units, its  representation |
| 6 | Types of force :Point force/concentrated  force & Uniformly distributed force effects of force |
| 3 | 7 | characteristics of a force, Different force systems (coplanar and non-coplanar), | 3rd | 2.VerificationofLami’s theorem. |
| 8 | principle of transmissibility of forces, law of superposition |
| 9 | Free body diagram, Composition and resolution of coplanar concurrent forces, resultant force, method of composition of forces |
| 4 | 10 | laws of forces, parallelogram law of forces (with derivation), triangle law of forces, polygon lawof forces - graphically, analytically, resolution of  forces | 4 th | 2.VerificationofLami’s theorem. |
| 11 | Resolving a force into two rectangular  Components |
| 12 | Lami 's theorem, Simple numericals, Equilibrium of forces and its determination. |
| 5 | 13 | Moment Concept of moment, Moment of a force  And units of moment | 5th | 3. Toverifylawofmomentsby  Using Bell crank lever. |
| 14 | Varignon's theorem (definition only), Principle of moment and its applications (Levers–simple and compound ,steelyard,  safety valve) |
| 15 | Simple numericals. Parallel forces (like and unlike parallel force), |
| 6 | 16 | calculating their resultant, Concept of couple, its properties and effects | 6th | 3Toverifylawofmomentsby  Using Bell crank lever. |
| 14 | General conditions of equilibrium of bodies  under  coplanar forces, Position of resultant force by moment. |
| 18 | 4.FrictionDefinitionandconceptoffriction,  Types of  friction, force of friction |

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| 7 | 19 | Laws of static friction, coefficient of friction, angle of friction | 7th | 4. To verify the forces in different members of jib crane. |
| 20 | angle of repose, cone of friction, Equilibrium of a body lying on a horizontal plane,  equilibrium of a body lying on a rough inclined plane |
| 21 | Calculation of least force required to maintain equilibrium of a body on a rough inclined plane subjected to a force acting along the inclined  Plane and |
| 8 | 22 | subjected to a force acting at some angle with the inclined plane, Simple numericals | 8th | 4. To verify the forces in different members of jib crane. |
| 23 | 5.Centre of Gravity and Centroid Concept |
| 24 | definition of centroid of plain figures and centre of gravity of symmetrical solid bodies. |

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| 9 | 25 | Axis of symmetry, Reference axis. Determination of centroid of plain and composite lamina ( T, L, C and Ishape) using moment method only | 9th | 5. To determine coefficient of friction between three pairs of given surface. |
| 26 | Centroid of bodies with removed portion |
| 27 | Determination of center of gravity of solid bodies  -cone, cylinder, hemisphere and sphere; composite bodies and bodies with portion  Removed |
| 10 | 28 | 6. Laws of Motion Newton’s laws of motion and their applications | 10th | 6 . To find out center of gravity of regular lamina. |
| 29 | Concept of momentum. Derivation of force equation from second law of motion |
| 30 | Numerical problems on second law of motion |
| 11 | 31 | Bodies tied with string, Newton’s third law of motion numerical problems | 11th | 7. To find out center of gravity of irregular lamina. |
| 32 | conservation of momentum, impulse and impulsive force. |
| 33 | Revision |
| 12 | 34 | Revision | 12th | 8. To find the mechanical advantage ,velocity ratio and efficiency of a screw jack. |
| 35 | Simple Machines Definition of effort, velocity ratio, mechanical advantage |
| 36 | Efficiency of a machine and their relationship |
| 13 | 37 | Law of machines, Simple and compound machine (Examples). | 13t h | 9. To find the mechanical advantage, velocity ratio and efficiency of worm and worm wheel. |
| 38 | Definition of ideal machine, reversible and self- locking machine |
| 39 | Effort lost in friction, Load lost in friction |
| 14 | 40 | Determination of maximum mechanical advantage and maximum efficiency, Simple numerical. | 14t h | 10. To find mechanical advantage, velocity ratio and efficiency of single  Purchase crab. |
| 41 | System of pulleys(first ,second, third system of  pulley |
| 42 | determnation of velocity ratio, mechanical advantage  and efficiency |
| 15 | 43 | Working principle and application of wheel and axle, | 15t h | Revision |
| 44 | Weston’s Differential Pulley Block |
| 45 | simple screw jack ,worm and worm wheel |
| 16 | 46 | Single and double winch crab | 16t h | Revision |
| 47 | Expression for their velocity ratio and field of their\application. |
| 48 | Revision |