# Lesson Plan

Name of the Faculty : G.F

Discipline : Civil Engg.

Year/Semester : 1st Year

Subject : **Applied Mechanics**

Lesson Plan duration : 37 weeks

Work load per week : Lecture – 02, Practical – 02

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| Week | Theory | | Practical | |
| Lecture | Topic (Including assessment/test) | Topic | |
| 1st | 1st | **Introduction :** Concept of  engineering mechanics definition of mechanics | 1st | Introduction about the Lab and brief discussion over the practical work to be conducted |
| 2nd | Statics, dynamics. |
| 2nd | 3rd | Different systems of units (FPS, CGS,  MKS and SI) and their conversion from one to another. | 2nd | Verification of the polygon law of forces using Gravesand’s apparatus. |
| 4th | Simple Numerical Problems, Fundamental Units and Derived Units |
| 3rd | 5th | Concept of rigid body, scalar and vector quantities | 3rd | Verification of the polygon law of forces usingGravesand’s apparatus. |
| 6th | **Laws of forces :** Definition of force, Bow’s Notations, types of force |
| 4th | 7th | Point force/concentrated force &  Uniformly distributed force, effects of force, characteristics of a force | 4th | Checking of Practical File |
| 8th | Different force systems |
| 5th | 9th | Principle of transmissibility of forces | 5th | To verify the forces in different members of jib crane. |
| 10th | Law of super-position |
| 6th | 11th | Composition and resolution of coplanar concurrent forces, resultant | 6th | To verify the forces in |

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|  |  | Force Method of composition of forces |  | different members of jib crane. |
| 12th | Laws of forces, triangle law of forces |
| 7th | 13th | Polygon law of forces - graphically, analytically, resolution of forces | 7th | Checking of Practical File |
| 14th | Free body diagram |
| 8th | 15th | Equilibrant force and its  Determination | 8th | To verify the reaction at the supports of a simply supported beam. |
| 16th | Lami's theorem |
| 9th | 17th | Simple problems on above topics | 9th | To verify the reaction at the supports of a simply supported beam. |
| 18th | **st**  **1 Internal Assessment Exam** |
| 10th | 19th | **Assessment** | 10th | Checking of Practical File |
| 20th | **Moment :** Concept of moment |
| 11th | 21th | Moment of a force and units ofmoment | 11th | To find the mechanical advantage, velocity ratio and efficiency in case of an inclined plane. |
| 22th | Varignon's theorem (definition only) |
| 12th | 23th | Principle of moment and its  Applications | 12th | To find the mechanical advantage, velocity ratio and efficiency in case of an inclined plane. |
| 24th | Levers – simple and compound, |
| 13th | 25th | Steel yard, safety valve, reaction at  support) | 13th | Checking of Practical File |
| 26th | Parallel forces (like and unlike parallel force) calculating their resultant |
| 14th | 27th | Concept of couple, its properties | 14th | **1st Internal Assessment Exam (Tentative)** |
| 28th | Effects of Couple |
| 15th | 29h | General conditions of equilibrium of | 15th | To find the mechanical |

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|  |  | bodies under coplanar forces |  | advantage, velocity ratio and efficiency of a screw jack. |
| 30th | Position of resultant force by moment |
| 16th | 31th | Simple problems on the above topics | 16th | To find the mechanical advantage, velocity ratio and efficiency of a screw jack. |
| 32th | **Friction :** Definition and concept of friction, types of friction |
| 17th | 33th | Force of friction, Limiting Friction | 17th | Checking of Practical File |
| 34th | Laws of static friction |
| 18th | 35th | Coefficient of friction angle of  friction, angle of repose | 18th | To find the mechanical advantage, velocity ratio and efficiency of worm and worm wheel |
| 36th | Equilibrium of a body lying on a horizontal  plane |
| 19th | 37th | Equilibrium of a body lying on a rough inclined plane Ladder friction | 19th | To find the mechanical advantage, velocity ratio and efficiency of worm and worm wheel |
| 38th | Advantages and Disadvantages of Friction Methods of increasing/decreasing the force of friction. |
| 20th | 39th | Problems | 20th | Checking of Practical File |
| 40th | **2nd Internal Assessment Exam** |
| 21st | 41st | **Centre of Gravity :** Concept | 21st | To find mechanical advantage, velocity ratio and efficiency of single purchase crab. |
| 42nd | Definition of Centroid of plain figures |
| 22nd | 43rd | Centre of gravity of Symmetrical solid bodies | 22nd | To find mechanical advantage, velocity ratio and efficiency of single purchase crab. |
| 44th | Difference between Centroid and C.G |
| 23rd | 45th | Determination of Centroid of plain  and composite lamina using moment method only | 23rd | Checking of Practical |

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|  | 46th | Centroid of bodies with removed Portion |  | File |
| 24th | 47th | Determination of center of gravity of solid bodies – Cylinder | 24th | To find out center of gravity of regular lamina. |
| 48th | Determination of center of gravity of solid bodies - Cube, |
| 25th | 49th | Determination of center of gravity of solid bodies Cuboid | 25th | To find out center of gravity of regular lamina. |
| 50th | Determination of center of gravity of solid bodies Sphere |
| 26th | 51st | Determination of center of gravity of composite bodies | 26th | Checking of Practical File |
| 52nd | Determination of center of gravity of solid bodies with portion removed |
| 27th | 53rd | Problems of above topic | 27th | **2nd Internal Assessment Exam (Tentative)** |
| 54th | **Simple Machines :** Definition of Simple and compound machine (Examples) |
| 28th | 55th | Definition of load, effort, velocity ratio, mechanical advantage | 28th | To find out center of gravity of irregular lamina |
| 56th | Efficiency of a machine and their relationship, law of machines |
| 29th | 57th | Definition of ideal machine, reversible and self locking machine | 29th | Checking of Practical File |
| 58th | Effort lost in friction, Load lost in friction**.** |
| 30th | 59th | Determination of maximum mechanical advantage and maximum  efficiency | 30th | To find out center of gravity of irregular lamina |
| 60th | System of pulleys (first, second, third system of pulleys) |
| 31st | 61st | Determination of velocity ratio, mechanical advantage and efficiency | 31st | Checking of Practical File |
| 62nd | Working principle and application of wheel and axle |
| 32nd | 63rd | Weston’s Differential Pulley Block | 32nd | To determine coefficient of friction between three pairs of given surface |
| 64th | Simple screw jack |

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| 33rd | 65th | Worm and worm wheel | 33rd | Checking of Practical File |
| 66th | Single and double winch crab. |
| 34th | 67th | Expression for their velocity ratio and field of their application of above m/c | 34th | To determine coefficient of friction between three pairs of given surface |
| 68th | Numerical Problems of MA and Efficiency |
| 35th | 69th | Numerical problems of effort lost | 35th | Checking of Practical File |
| 70th | Numerical problems of load lost. |
| 36th | 71st | Numerical problems of pulley 1st and 2ndsystems to calculated V.R ,M.A  and efficiency rd | 36th | Internal Viva |
| 72nd | Numerical problems of 3 system pulley systems to calculated V.R ,M.A and efficiency |
| 37th | 73rd | Revision | 37th | Internal Viva |
| 74th | Revision |