

**Subject : Engineering Mechanics**

**Class : First year**

**Hours : 2hrs ( Theoretical ) , 2hrs ( Practical )**

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**Objectives :**

The student will know the manner of dealing with forces acting on bodies , the relation between the force and its components , the principal of moments & couples . An other purpose was to help the student to develop the logical , orderly processes of thinking which characterizes the engineer .

<b>Week</b>	<b>Syllabus</b>
<b>1&amp;2</b>	<b>Introduction to mechanics , Force systems , Scalar &amp; vector quantities , Parallelogram law , Triangle law , Forces &amp; components .</b>
<b>3&amp;4</b>	<b>Moment of a force , Varignon`s theorem , Applications</b>
<b>5&amp;6</b>	<b>Couples , Resolution of a force into a force &amp; a couple .</b>
<b>7&amp;8</b>	<b>Resultant of force systems , Resultant of concurrent force system , Resultant of parallel force system , Resultant of non-concurrent force system .</b>
<b>9&amp;10&amp;11</b>	<b>Equilibrium of force system , Free body diagram , Equilibrium of concurrent force system , Equilibrium of parallel force system , Equilibrium of non-concurrent force system .</b>
<b>12</b>	<b>Types of beams, Supports, and loads, Equilibrium of beams.</b>
<b>13&amp;14&amp;15</b>	<b>Trusses, Analysis of trusses, method of Joint , method of section .</b>
<b>16&amp;17</b>	<b>Analysis of frames ( method of members ) .</b>
<b>18&amp;19&amp;20</b>	<b>Friction , Theory of friction , Angle of friction , Types of friction , Wedges ,Applications.</b>
<b>21&amp;22</b>	<b>Centroids of areas &amp; lines , Centroids by integration , Centroids of composite areas , Applications.</b>
<b>23&amp;24&amp;25</b>	<b>Moment of inertia , Polar moment of inertia , Radius of gyration , Transfer formula for moment of inertia , Moment of inertia for composite areas , Product of inertia , Moment of inertia with respect to inclined axes , Mohr` circle for moment of inertia .</b>

<b>26</b>	<b>Principles of dynamics , Kinematics &amp; kinetics , Motion of a particle , Fundamental Equations of kinetics for a particle , Effective force on a particle.</b>
<b>27&amp;28</b>	<b>Rectilinear translation , Rectilinear motion with constant acceleration , Free falling bodies .</b>
<b>29&amp;30</b>	<b>Kinetics of rectilinear translation ( Analysis as a particle ) , Dynamic Equilibrium in translation ( Analysis as a rigid body ) .</b>

### **References:**

- 1. Engineering Mechanics / F.L. Singer**
- 2. Engineering Mechanics / Mclean & Nelson**
- 3. Engineering Mechanics / J.F. Shelley**
- 4. Engineering Mechanics / A. Higdon & W.B. Stiles**
- 5. Mechanics for Engineers / Statics / F.P. Beer , E.R. Johnston,Jr**