**COURSE CODE : ME1C02**

**COURSE TITLE** : **ENGINEERING MECHANICS**

**UNIVERSITY : DIBRUGARH UNIVERSITY**

**SEMESTER : SECOND SEMESTER**

**CREDIT : 04**

**L:T:P : 3:1:0**

**End sem. Examination for this course will carry 100 marks**

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| Module | Details of module | No. of Lectures |
| 1 | *Introduction to Engineering Mechanics* covering, Basic concepts, System of Forces, Coplanar Concurrent Forces, Components in Space – Resultant- Moment of Forces and its Application; Couples and Resultant of Force System, Equilibrium of System of Forces, Free body diagrams, Equations of Equilibrium of Coplanar Systems and Spatial Systems; Virtual work |  |
| 2 | *Friction* covering, Types of friction, Limiting friction, Laws of Friction, Static and Dynamic Friction; Motion of Bodies, wedge friction, screw jack; ladder friction, lifting machine |  |
| 3 | *Centroid and Centre of Gravity* covering, Centroid of simple figures from first principle, centroid of composite sections; Centre of Gravity and its implications; Area moment of  inertia- Definition, Moment of inertia of plane sections from first principles, Theorems of moment of inertia, Moment of inertia of standard sections and composite sections; Mass moment inertia of circular plate, Cylinder, Cone, Sphere, Hook. |  |
| 4 | Analysis of framed structure (Trusses), perfect and important frame, determinations of reactions, determination of stress- tensile and compression, graphical method, analytical method. |  |
| 5 | *Introduction to Dynamics* covering, Basic terms, general principles in dynamics; Types of motion, Instantaneous centre of rotation in plane motion and simple problems; D‟Alembert‟s principle and its applications in plane motion and connected bodies; Work energy principle and its application in plane motion of connected bodies; Kinetics of rigid body rotation; |  |
| 6 | *Mechanical Vibrations* covering, Basic terminology, free and forced vibrations, resonance and its effects; Degree of freedom; Derivation for frequency and amplitude of free vibrations without damping and single degree of freedom system, simple problems, types of pendulum, use of simple, compound and torsion pendulums; |  |

***Text/Reference Books:***

1. Shanes and Rao (2006), *Engineering Mechanics,* Pearson Education,

2. Hibler and Gupta (2010),*Engineering Mechanics (Statics, Dynamics*) by Pearson Education

3. Reddy Vijaykumar K. and K. Suresh Kumar(2010), *Singer‟s Engineering Mechanics*

4. Bansal R.K.(2010), *A Text Book of Engineering Mechanics,* Laxmi Publications

5. Khurmi R.S. (2010), *Engineering Mechanics,* S. Chand & Co.

6. Tayal A.K. (2010), *Engineering Mechanics,* Umesh Publications