

16ME102

ENGINEERING MECHANICS

I Year I semester

UNIT - 1

L-10; T-3

GENERAL PRINCIPLES: Introduction to engineering mechanics, Dealization in mechanic's basic concepts, Vectors and scalar quantity, Laws of mechanics.

FORCE SYSTEM AND RESULTANT: Concept of force, Representation of force, System of forces, resolution of forces using rectangular components.

MOMENTS AND COUPLES: Introduction, Moment of force, Varignon's theorem, Resultant of parallel forces, Couple and moment of couple, Characteristic of couple.

UNIT - 2

L-8; T-3

EQUILIBRIUM OF BODIES: Conditions of equilibrium for a coplanar force system and coplanar non parallel non concurrent force system, Principle of equilibrium (two, three, force principle), Lami's theorem.

TRUSS: Introduction, Classification of truss, Fundamental of truss, Analysis of truss (method of joints and method of section).

UNIT - 3

L-10; T-3

FRICTION: Introduction, Classification of friction, Coefficient of friction, Laws of friction, Angle of friction, Angle of repose, Cone of friction, Ladder friction, Wedge friction.

UNIT - 4

L-10; T-3

CENTROID: Introduction, Centroid of lines, Centroid of surfaces, Determine of centroid of simple figures, Centroid of composite figures, Centroid of a parabolic spandrel.

CENTER OF GRAVITY: Introduction, Center of gravity, Location of center of gravity - Right circular cone, Solid hemisphere, Center of mass, Theorem of Pappus.

UNIT - 5

L-10; T-3

MOMENT OF INERTIA: Moment of inertia of plane areas, Polar moment of an area, Radius of gyration of area, Parallel axis theorem, Perpendicular axis theorem, Moment of inertia of composite areas, Mass moment of inertia - Introduction, Radius of gyration of mass, Rod, Rectangular plate, Right circular cylinder, Circular ring, Circular plate.

TEXTBOOKS:

1. A K Dhiman, P Dhiman. And D. C Kulshreshtha, "Engineering Mechanics: Statics and Dynamics", Mc Graw Hill ,2015
2. Basudeb Bhattacharyya, "Engineering Mechanics", 2nd Edition, Oxford University Press 2014.

REFERENCE BOOKS:

1. N H Dubey" Engineering Mechanics : statics and dynamics", 1st Edition, Mc Graw Hill, 2015.
2. S SBhavikatti, "Engineering Mechanics", 1st edition, New age International, reprint 2015.
3. J. L. Meriam, L. G. Kraige, "Engineering Mechanics: Statics", 8th Edition d., John Wiley and sons, 2015.