Course Number and Name
BME202 - ENGINEERING MECHANICS
Credits and Contact Hours
3 & 60
Course Coordinator's Name
Mr.D.Ravi
Text Books and References

TEXT BOOK:

1. Beer, F.P and Johnson Jr. E.R, "Vector Mechanics for Engineers: Vol. 1 Statics and vol. 2 Dynamics**",** McGraw-Hill International Edition, 2013.
2. Rajasekaran, S, Sankarasubramanian, G., Fundamentals of Engineering Mechanics, Vikas Publishing House Pvt., Ltd., 2011.

 REFERENCES :

1. Kumar, K. L Kumar, V., Engineering Mechanics, Tata McGraw – Hill, New Delhi, 2010
2. Palanichamy, M.S., Nagan, S., Engineering Mechanics – Statics & Dynamics, Tata McGraw - Hill, 2013.
3. Timoshenko, and Young, Engineering Mechanics, Tata McGraw-Hill, New Delhi, 2013.
4. Irving H. Shames, Engineering Mechanics – Statics and Dynamics, IV Edition – Pearson Education Asia Pvt., Ltd., 2006.

Course Description
• To understand the concept of basic engineering mechanism

Prerequisites	Co-requisites
Engineering Physics –I Engineering Mathematics I	Engineering Mathematics II

required, elective, or selected elective (as per Table 5-1)

Course Outcomes (COs)	
CO1	Students will understand the concepts of engineering mechanics
CO2	Students will understand the vectorial representation of forces and moments
CO3	Students will gain knowledge regarding center of gravity and moment of inertia and apply them for practical problems.
CO4	Students will gain knowledge regarding various types of forces and reactions and tom draw free body diagram to quicker solutions for complicated problems.
CO5	Student will gain knowledge in solving problems involving work and energy
CO6	Student will gain knowledge on friction on equilibrium and its application.

Student Outcomes (SOs) from Criterion 3 covered by this Course

COs/SOs	a	b	c	d	e	f	g	h	i	j	k	
CO1	H	H	L	H		H		L		H	H	
CO2						H	H	L				

						H	H	L		M		
CO3						H	H	L		M		
CO4						H	H	L		M		
CO5						H	H	L		M		
CO6						H	H	L		M		

List of Topics Covered

UNIT I   BASICS AND STATICS OF PARTICLES   12

Introduction - Units and Dimensions - Laws of Mechanics – **Lame's theorem, Parallelogram and triangular Law** of forces – Vectors –Vectorial representation of forces and moments – Vector operations on forces - Coplanar Forces – Resolution and Composition of forces – Resultant of several concurrent forces - Equilibrium of a forces – Forces in space - Equilibrium of particle in space - Equivalent systems of forces – Principle of transmissibility – Single equivalent force.

UNIT II   EQUILIBRIUM OF RIGID BODIES   12

Free body diagram – Types of supports and their reactions – requirements of stable equilibrium – Moments and Couples – Moment of a force about a point and about an axis –Vectorial representation of moments and couples– Scalar components of a moment – **Varignon's theorem** - Equilibrium of Rigid bodies in two dimensions -Equilibrium of Rigid bodies in three dimensions.

UNIT III   PROPERTIES OF SURFACES AND SOLIDS   12

Determination of areas – First moment of area and the Centroid of standard sections – T section, I section, Composite figures, Hollow section – second moments of plane area – Rectangle, triangle, circle - T section, I section, Hollow section – Parallel axis theorem and perpendicular axis theorem – Polar moment of inertia – Principal moments of inertia of plane areas – Principal axes of inertia – Basic concept of Mass moment of inertia.

UNIT IV   FRICTION   12

Frictional force – Laws of Coloumb friction – Cone of friction – Angle of repose – Simple contact friction – Sliding of blocks – Wedge friction - Ladder friction – Screw Jack – Belt friction - Rolling resistance.

UNIT V   DYNAMICS OF PARTICLES   12

Displacements, Velocity and acceleration, their relationship – Relative motion – Relative acceleration – Curvilinear motion of particles – **Newton's law** – work energy equation – impulse and Momentum – Impact of elastic bodies.