



DEMAND

PAVIATH INTEGRATED SOLUTION

CIVIL ENGG

CIVIL UNIV

ENGINEERING MECHANICS

Paviath ONLINE

◆ CIVIL UNIVERSITY ◆ FIRST YEAR ◆ CODE AI0302

UNIT - I

INTRODUCTION TO ENGINEERING MECHANICS - BASIC CONCEPTS, RESULTANTS OF FORCE SYSTEM: PARALLELOGRAM LAW - FORCES AND COMPONENTS- RESULTANT OF COPLANAR CONCURRENT FORCES - COMPONENTS OF FORCES IN SPACE - MOMENT OF FORCE - PRINCIPLE OF MOMENTS - COPLANAR APPLICATIONS - COUPLES - RESULTANT OF ANY FORCE SYSTEM, EQUILIBRIUM OF FORCE SYSTEMS : FREE BODY DIAGRAMS, EQUATIONS OF EQUILIBRIUM - EQUILIBRIUM OF PLANAR SYSTEMS - EQUILIBRIUM OF SPATIAL SYSTEMS.

UNIT - II
FRICTION: INTRODUCTION - THEORY OF FRICTION - ANGLE OF FRICTION - LAWS OF FRICTION - STATIC AND DYNAMIC FRICTIONS - MOTION OF BODIES: WEDGE, SCREW, SCREW-JACK, AND DIFFERENTIAL SCREW-JACK.
TRANSMISSION OF POWER: FLAT BELT DRIVES - TYPES OF FLAT BELT DRIVES - LENGTH OF BELT, TENSIONS, TIGHT SIDE, SLACK SIDE, INITIAL AND CENTRIFUGAL - POWER TRANSMITTED AND CONDITION FOR MAX. POWER

UNIT - III

CENTROIDS AND CENTERS OF GRAVITY: INTRODUCTION - CENTROIDS AND CENTRE OF GRAVITY OF SIMPLE FIGURES (FROM BASIC PRINCIPLES) - CENTROIDS OF COMPOSITE FIGURES - THEOREM OF PAPPUS - CENTER OF GRAVITY OF BODIES AND CENTROIDS OF VOLUMES, MOMENTS OF INERTIA : DEFINITION - POLAR MOMENT OF INERTIA - RADIUS OF GYRATION - TRANSFER FORMULA FOR MOMENT OF INERTIA - MOMENTS OF INERTIA FOR COMPOSITE AREAS - PRODUCTS OF INERTIA, TRANSFER FORMULA FOR PRODUCT OF INERTIA, MASS MOMENT OF INERTIA - MOMENT OF INERTIA OF MASSES- TRANSFER FORMULA FOR MASS MOMENTS OF INERTIA - MASS MOMENT OF INERTIA OF COMPOSITE BODIES.

UNIT - IV

KINEMATICS OF A PARTICLE: MOTION OF A PARTICLE - RECTILINEAR MOTION - MOTION CURVES - RECTANGULAR COMPONENTS OF CURVILINEAR MOTION- KINEMATICS OF RIGID BODY - TYPES OF RIGID BODY MOTION - ANGULAR MOTION - FIXED AXIS ROTATION KINETICS OF PARTICLES: TRANSLATION - ANALYSIS AS A PARTICLE AND ANALYSIS AS A RIGID BODY IN TRANSLATION - EQUATIONS OF PLANE MOTION - ANGULAR MOTION - FIXED AXIS ROTATION - ROLLING BODIES.

UNIT - V

WORK - ENERGY METHOD : WORK ENERGY EQUATIONS FOR TRANSLATION - WORK-ENERGY APPLICATIONS TO PARTICLE MOTION - WORK ENERGY APPLIED TO CONNECTED SYSTEMS - WORK ENERGY APPLIED TO FIXED AXIS ROTATION AND PLANE MOTION, IMPULSE AND MOMENTUM, MECHANICAL VIBRATIONS : DEFINITIONS AND CONCEPTS - SIMPLE HARMONIC MOTION - FREE VIBRATIONS, SIMPLE AND COMPOUND PENDULUMS - TORSION PENDULUM - FREE VIBRATIONS WITHOUT DAMPING: GENERAL CASES.

TEXT BOOKS:

1. ENGINEERING MECHANICS - STATICS AND DYNAMICS BY FERDINAND.L. SINGER/ HARPER INTERNATIONAL EDITION.
 2. ENGINEERING MECHANICS/ S. TIMOSHENKO AND D.H. YOUNG, MC GRAW HILL BOOK COMPAN.
- REFERENCES:
1. ENGINEERING MECHANICS / IRVING SHAMES / PRENTICE HALL.
 2. A TEXT OF ENGINEERING MECHANICS /YVD RAD/ K. GOVINDA RAJULU/ M. MANZDOR HUSSAIN, ACADEMIC PUBLISHING COMPANY.
 3. ENGG. MECHANICS / M.V. SESHAGIRI RAD & D RAMA DURGAIAH/ UNIVERSITIES PRESS.
 4. ENGINEERING MECHANICS, UMESH REGL / TAYAL.
 5. ENGG. MECHANICS / KL KUMAR / TATA MCGRAW HILL.
 6. ENGG. MECHANICS / S.S. BHAVIKATI & K.G. RAJASEKHARAPPA.



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