PVP SIDDHARTHA INSTITUTE OF TECHNOLOGY, KANURU, VIJAYAWADA
(Autonomous)

DEPARTMENT OF AERONAUTICAL ENGINEERING
COURSE STRUCTURE WITH EFFECT FROM 2012-13

I Year B.Tech. A.E.

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4+1*	0	4

AE1T3- ENGINEERING MECHANICS - I

UNIT – I

Concurrent Forces in a Plane:

Principles of statics, Force, Addition of two forces: Parallelogram Law – Composition and resolution of forces – Constraint, Action and Reaction. Types of supports and support reactions.

Free body diagram. Equilibrium of concurrent forces in a plane – Method of projections – Moment of a force, Theorem of Varignon, Method of moments.

UNIT –II

Parallel Forces in a Plane: Introduction, Types of parallel forces, Resultant. Couple, Resolution of force into force and a couple. General case of parallel forces in a plane.

UNIT – III

Forces in Space: Components of a force in Space – Position Vector– Moment of Force

UNIT – IV

Centroids: Introduction, Determination of centroids of simple figures by integration method, Centroids of composite plane figures, Pappus theorem.

UNIT – V

Area moments of Inertia : Definition – Polar Moment of Inertia, Transfer Theorem, Moments of Inertia of Composite Figures, Products of Inertia, Transfer Formula for Product of Inertia.

UNIT – VI

Analysis of Trusses by Method of joints: Types of Trusses – Assumptions for forces in members of a perfect truss, Force table, Cantilever Trusses, Structures with one end hinged and the other freely supported on rollers carrying horizontal or inclined loads.

UNIT – VII

Friction: Introduction, Classification of friction, Laws of dry friction. Co-efficient of friction,

Angle of friction, Angle of repose, Cone of friction, Frictional forces on wheel, Wedge friction.

UNIT – VIII

Principle Of Virtual Work: Equations for Translation, Work-Energy Applications to Particle Motion, Connected System-Fixed Axis Rotation and Plane Motion. Impulse momentum method.

Text books:

1. Engineering Mechanics by S.Timoshenko & D.H.Young, McGraw Hill International Edition. (For Concepts and symbolic Problems).
2. Engineering Mechanics Statics and dynamics by A.K.Tayal, Umesh Publication, Delhi, (For numerical Problems using S.I.System of Units).

References:

1. Vector Mechanics for Engineers Statics and Dynamics by Beer and Johnston, Tata McGraw Hill Publishing Company, New Delhi.
2. Engg. Mechanics / S.S. Bhavikatti & J.G. Rajasekharappa
3. Singer's Engineering Mechanics Statics and Dynamics by K.Vijaya Kumar Reddy and J Suresh Kumar (Third Edition SI Units-BS Publications.)

Web References:

http://openlibrary.org/books/OL22136590M/Basic_engineering_mechanics
http://en.wikibooks.org/wiki/Engineering_Mechanics
http://nptel.iitm.ac.in/video.php?courseId=1048
http://imechanica.org/node/1551
http://emweb.unl.edu/
http://ebooks-freedownload.com/2009/11/engineering-mechanics-statics-12.html
http://www.ebookee.com/Engineering-Mechanics-Statics_37859.html