10 ME 325 PRINCIPLES OF MACHINE DESIGN (SI UNITS)

III B.Tech II Semester

(with effect from the academic year 2012-2013)

. *Credits: 4*

Lectures/week: 4 Hrs *Sessional Marks: 40*

University Exam:3 Hrs *End Examination Marks: 60*

UNIT-I

Mechanical Engineering design

Traditional Design methods; Design Synthesis; Design considerations and standards; Engineering materials- classification and selection, Mechanical properties of materials; BIS designation of steels

Design against static load

Modes of failure; factor of safety; Stress-strain relationships; shear stress and shear strain relationships; Axial, Bending, Torsional stresses; principle stresses; Theories of failure.

UNIT-II

Design against Fluctuating loads

Stress Concentration factors; Reduction of stress concentration effects ; Fluctuating stresses; fatigue Failure; Endurance limit; Notch sensitivity; Endurance limit; Soderberg and Goodman Diagrams; Modified Goodman's diagrams; Fatigue design under combined stresses.

UNIT-III

Design of Threaded joints

Threaded joints-Terminology, Bolted joint in tension; Torque requirement for bolt tightening; bolted joint under fluctuating load; eccentricity loaded bolted joints in shear; bolted joints with combined stresses; Bolt of uniform strength.

UNIT-IV

Deign of Welded joints

Welded joints-types of welded joints; stresses in butt and fillet welds; strength of welded joints; eccentricity welded joint; weld joint subject to bending moment and fluctuating forces; welding symbols; weld inspection.

UNIT-V

Mechanical springs

Helical springs-Stress equation and deflection equation; spring materials; Design against static and fluctuating loads; Design of helical springs; Compound springs ; equalized stress in spring leaves ; multi leaf springs; nipping and shot peening.

TEXT BOOKS:

1. Design of Machine Elements : Bhandari V. B.
2. Machine Design : Khannaiah P

REFERENCES:

1. Machine Design : Khurmi R.S
2. Mechanical Engineering Design : Shigley J. E.
3. Machine Design : Sharma P.C. & Aggarwal D.K.