



Department of AERONAUTICAL ENGINEERING



SOLID MECHANICS (R22A2108) COURSE COVERAGE SUMMARY

Prepared by: G Sai Sathyanarayana Assistant Professor Department of ANE sathyanarayana@mrcet.ac.in

B.TECH II – II SEMESTER - COURSE COVERAGE SUMMARY SUBJECT: Solid Mechanics (R22A2108)

UNIT	TITLE OF THE UNIT	TOPIC OF THE UNIT	NAME OF THE TEXT BOOK	CHAPTER NO.	PAGE NO.
1	Analysis of stress	Introduction to Solid Mechanics – Basic Concepts, Types of Stress, General State of Stress at a Point, State of stress at a point, Complimentary Shear stresses, Stresses on Oblique planes, Materials Subjected to pure shear, Material subjected to two mutually perpendicular direct stresses, Material subjected to combined direct and shear stresses, Principal plane inclination in terms of associated principal stress, graphical solution	Strength of MaterialsbyRS Khurmi, S Chand and company Ltd	7	108- 147
2	Members Subjected to Flexural Loads	Geometric Forms of beams, Classifications of beams, statistically determinate and Indeterminate Beams, Concept of Shear Force and bending moment in beams, Basic Relationship between the Rate of Loading, Shear Force and Bending Moment Diagrams, Simple Bending theory and Derivation Of flexural equation.	Strength of Materials by RS Khurmi, S Chand and company Ltd	13	286- 343
3	Deflection of beams	For a simply supported and Cantilever beam with problems using Double Integration method and Macaulay's method. Concept of overhanging, fixed and Continuous beams	Strength of Material by RS Khurmi, S Chand and company Ltd	16	383- 404
4	Elastic stability of Columns	Theories of Elastic Failure, Euler's theory, Critical load determination of columns with different end constraints, Rankine and Johnson Formulae. Concepts of beam- column buckling	Strength of Materials by RS Khurmi, S Chand and company Ltd	34	795- 820
5	Theories of failures	Von-mises theory, octahedral shears distortion energy theory, Maximum principle elastic strain theory, Maximum principle shear strain theory, Maximum shear stress theory	Strength of Materials by S Ramamrutam, Dhanpat Rai Publications	14	706- 726