SUBJECT NO-MT31007, SUBJECT NAME- CREEP, FATIGUE AND FRACTURE

LTP- 3-0-0,CRD- 3

SYLLABUS :-

Prerequisite Ã¢ÂÂ NilIntroduction to deformation behaviour of materials and standard mechanical tests: Hardness, Tension, Compression, Impact and Transition Temperature.Creep of solids, temperature - stress - strain relationships, Creep and stress rupture tests, deformation mechanisms at elevated temperature, deformation mechanism maps, parametric relationships, Design of materials for elevated temperature application, Superplasticity and Life Prediction. Cyclic stress-and-strain controlled fatigue, S-N curve, effect of notch on fatigue life, fatigue crack initiation mechanisms, microscopic fracture modes and mechanisms, creep-fatigue interaction, corrosion fatigue, parameters affecting fatigue, fatigue crack growth, Paris law, Fatigue threshold, Life estimation. Griffith theory, Elements of fracture mechanics, stress analysis of cracks, Linear, elastic and elastic-plastic fracture mechanics, plastic zone size, fracture toughness testing, KIC, CTOD, J-Integral, fracture toughness of engineering alloys, ceramics and polymers: role of microstructure on fracture toughness. Environment assisted fracture.Standards and codes.Text Books:1.R.W. Hertzberg: Deformation and Fracture of Engineering Materials, 3rd Ed., John Wiley and Sons, New York, 1989.2.T.H. Courtney: Mechanical Behaviour of Materials, McGraw Hill Book Company, New Delhi, 1990.