

COMPOSITE STRUCTURES

Module I:

Introduction: definition and characteristics, fibres, matrices, fibre reinforced composites, advantages and limitations, basic concepts and characteristics: isotropy, orthotropic, classification, lamina and laminate, micromechanics and micromechanics, constituent materials and properties.

Module II:

Elastic behaviour of unidirectional lamina: specially orthotropic and transversely isotropic material, relation between mathematical and engineering constants, stress strain relations for thin lamina, transformation of stress and strain, transformation of elastic parameters, transformation of stress-strain relations in terms of engineering constants.

Module III:

Elastic behaviour of multidirectional laminates, symmetric and balanced laminates, design considerations, computational procedure for finding engineering elastic properties, stress and failure analysis of multidirectional laminates.

Module IV:

Bending of laminated composite plates, thin laminated plate theory, deflection of all edges simply supported rectangular symmetric cross-ply laminate, two opposite edges simply supported.

Books:

1. I.M. Daniel & O. Ishai, "Engineering Mechanics of Composite Materials", Oxford Press
2. S.W.Tsai&H.T.Hahn, "Introduction to Composite Materials: Technomic Pub. Co.INC, USA.
3. P.K.Sinha,"A short term course on Composite Materials and Structures"-1996