

MECHANICS OF COMPOSITE MATERIALS

Classification and characterization of composite materials; fibrous, laminated and particulate composites; laminae and laminates; manufacture of laminated fiber reinforced composite material. Macromechanical behaviour of lamina; stress strain relations, engineering constraints for orthotropic materials. Stress strain relations for lamina of arbitrary orientation. Strength and stiffness of an orthotropic lamina; Biaxial strength theories. Micromechanical behavior of laminae. Rule of mixtures. Micromechanical behaviour of laminates: single layered configurations, symmetric laminates, anti-symmetric laminates, known symmetric laminates; strength of laminates; Interlaminar stresses; Design of laminates. Buckling and vibration of laminated beams, plates and shells.

Text Books:

Mechanics of Composite Materials – R. M. Jones. Taylor & Francis.

Reference Books:

1. Mechanics of Laminated Composite Plates and Shells – J. N. Reddy. CRC Press.
2. Stress Analysis of Fiber- Reinforced Composite Materials – M. W. Hyer. WCB McGrawHill.