7th Semester	RPL7D001	Polymer Composites Technology	L-T-P 3-0-0	3 Credits

Module I: **(12 hours)**

Composites and its constituents.

Introduction of composite material, Comparison between composites and other materials-advantages and disadvantages, classification of composites. Principles of composite reinforcement- Types of reinforcements- natural fibre, glass, carbon/graphite, aramid fibres, high strength and high modulus fibers. Types of matrix: Thermosetting and thermoplastic materials for the composites and their selection for particular applications

Module II: **(12 hours)**

Manufacturing Techniques of Composites.

Processing and production techniques i.e., Hand-lay-up, Spray-up, Bag moldings, Filament winding and Pultrusion Prepreg- manufacturing and characterization. Sheet moulding and dough moulding compounds and their processing, Preform and Resin transfer moldings. Hybrid and sandwich type composites

Module III: **(12 hours)**

Mechanics of Composite

Bonding & Failure criteria -micro mechanics approach of composites (Lateral and Longitudinal Tensile & Compressive loading of composites). Design of composite products: Basic design practice – material considerations, product considerations and design considerations

Books:

[1] P.K. Mallick, 'Composites Engineering Handbook', Marcel Dekker Inc.NY., 1997.
[2] S.T.Peters, "Handbook of Composites", Chapmun& hall, 2nd Edition 1998
[3] F.L. Matthews and R.D. Rawlings, 'Composite materials: engineering and science', Chapman and Hall, 1994
[4] D. Hull and T. W. Clyne, "An introduction to Composite Materials 2nd Ed", Cambridge, 1996