

RPL7D002 Polymer Blends and Alloys**Module I:****(10 Hours)****Introduction to Polymer Blends & Its Phase Behaviour**

Definition of polymer blends and alloys - Classification - Criteria for selection of polymer – Thermodynamics of miscibility – Phase morphology – Phase separation behaviour - Determination of morphology of polymer blend – Mechanical compatibility - Electron Microscopy.

Module II:**(10 Hours)****Blend Preparation Techniques**

Principles and methods involved in preparation of Polymer blends and alloys - Introduction to polymer rheology in blend – Interpenetrating polymer network: Synthesis, Morphology, Properties and application of polymer blend - Enhancement of polymer miscibility – utilization of miscible polymers.

Module III:**(12 Hours)****Types of Polymer Blends & Bonding**

Liquid Crystalline Polymer, Blends-Ternary Polymer – Elastomer, Blends-Polymer blends containing block copolymers– Biodegradable polymer blends- Recycled polymer blends, toughened polymers- Specific examples for toughened thermoplastics and thermosets - specific interaction - hydrogen bonding interaction, dipole-dipole interaction, ion–dipole & ion-ion interaction and additional specific interaction

Module IV(6 Hours)**Applications of Polymer Blends**

Application of Blends in Emerging technology - Photovoltaic, Light Emitting Diode, Electrochromic, Electric conductivity polymer and blends, Lithium battery & Fuel cells Applications

Books:

- [1] Lloyd M. Robeson - Polymer Blends: A Comprehensive Review, Hanser Publishers, 2007
- [2] Utracki, “Polymer Blends and Alloys”, Hanser Publisher
- [3] D R Paul and S Newman, “Polymer Blends Vol. I & II”, Academic Press Inc, 1978
- [4] Olabisi, I W Rubison and M T Shaw Polymer - Polymer Miscibility Academic Press - New York 1979