4th Semester	**RPL4C002**	**Plastic Materials and Applications**	**L-T-P 3-0-0**	**3 CREDITS**

Module-I (09 hours)

Polymer terminology:History-basic chemistry of polymers-nomenclature of polymers sources for raw materials- methods of manufacturing- general properties-processing behaviour.
Classification: Classification of polymersand applications of different polymers. Natural(Shellac resin and natural rubber) and synthetic polymers.

Module-II (09 hours)

Commodity Plastics - Properties, Characteristics & Applications Polyolefin - Polyethylene, LDPE, HDPE, LLDPE, HMHDPE, Polypropylene Polytyrene& Styrene copolymers - Polystyrene, HIPS, ABS, Styrene Vinyl plastics - Polyvinyl chloride, Polyvinyl Acetate, Polyvinylidene chloride Cellulosics - Cellulose nitrate, cellulose acetate, cellulose acetate butyrate,

Module-III (10 hours)

Engineering Plastics -Properties, Characteristics &Applications UHMHDPE -EVA ,Polyamides - Nylons 6, 66, 6 10, 11, 12. Acrylic plastics -Polymethyl Methacrylate, Polyacrylonitrile, Polyesters - Polyethylen terephthalate, Polybutylene terephthalate - Polycarbonate – Polyacetals, Aromatic ether - Polypheneylene oxide, Polyphenylene sulphide, Polysulfone, Polyimides Polyvinylfluoride, Polyvinylidene fluoride, Polytetrafluoroethylene, polychlorotrifluoroethylene.

Module-IV (07 hours)

Thermoset materials - Properties, Characteristics & Applications
Phenol formaldehyde - Urea formaldehyde - Melamine formaldehyde – Unsaturatedpolyesters, Epoxides - Polyurethane – Silicones, end use applications - case studies on applications

Module-V (10 hours)

Polymer blends and Alloys Definition, advantages of polymers, blends and alloys, role of composition, properties and applications of parameters for compability, PVC – Nitrile rubber, ABS-PVC and PP-EPDM Preleminary concepts of new materials such as electrically active polymers Optoelectronic plastics, Bio-polymers, Reinforced Plastics – principles of composite - reinforcement, effect of reinforcement on strength of plastics, Role and nature of bindersand coupling agents, properties and applications of fibres in reinforcement (glassand carbon), Properties and applications of FRP products.

Books:

- Plastic Materials Ed 7 - By Brydson, J.A
- Hand Book of Plastics Materials & Technology - By Rubin, Irwin, J
- Plastics Materials Hand Book - By Athalye, A.S
- Plastics Engineering Hand Book Ed. 5 & Society of the Plastic Industry Inc - By SPI.
- Plastics Materials and Processing - By Schwartz & Goodman