

(4 Lect./Week)

(4 hrs. Lab/Week)

(1 Student's presentation /Week)

(Total Credits -7)

## **Paper :: Polymer Processing and Mold Design**

1. Extruder and die design: Extrusion process, the extrusion die, extruder and die characteristics. Classification of extrusion dies, die swell.
2. Injection moulding: Principles, the moulding cycle, the injection moulding machine, some aspects of product quality, reaction injection moulding (RIM).
3. Blow moulding: Blow moulding principles, extrusion blow moulding, injection blow moulding, stretch blow moulding, blow moulding of PET.
4. Thermoforming: Principles, types and applications.
5. Compression and transfer moulding: Introduction, thermosetting compounds, compressing moulding process, transfer moulding.
6. Miscellaneous processing methods – casting and rotational moulding.
7. Mould Making – introduction, casting, electrodeposition, cold hobbing, pressure casting, spark machining, bench fitting.
8. Feed system: Runner and gates.
9. Ejection: Ejector grid, ejector plate assembly, ejection techniques, ejection from fixed half and sprue pullers.
10. Moulding internal undercuts: Form pin, split cores, side cores, stripping internal undercuts, moulds for threaded components. Daylight moulds – general, underfeed moulds, triple daylight mould.

### **Practical - Polymer IV:**

1. Compounding of PVC and rubbers in two roll-mills with fillers and reinforcing agents.
2. Preparation of Polymeric sheets by Compression moulding
3. Preparation of testing specimens by Injection moulding
4. Extrudate the various polymeric materials by single screw and twin screw extruders.
5. Solution casting of polymers membrane
6. Measurement of the rheological properties of rubber compounds by Oscillating Disc Rheometer (ODR)
7. Tool room visits.

### **Suggested Readings:**

1. Injection mould design, by R.G.W. Pye, Affiliated East West Press Pvt. Ltd (2000).
2. Plastics: Materials & Processing by A. B. Strong, Prentice Hall (2005).
3. Injection Moulding Handbook, Dominick V. Rosato and D. V. Rosato, CBS Publisher (2000)
4. Polymer Processing by Morton and Jones, Chapman & Hall (2007).
5. Plastic Engg. by R. J. Crawford, Butterworth-Heinemann (1998).
7. Plastic Processing Data Handbook by D. V. Rosato, Springer (2001).