PPE5I101 PLASTIC PROCESSING TECHNOLOGY

Module –I

Injection moulding,Compression moulding & Transfer moulding

Injection moulding -Principles processing- Process variables - Mould cycle – Moulding Machine–Specifications - Construction and maintenance –Mould setup- process trouble shooting.

Compression moulding- principles - Bulk factor and flow properties moulding materials-Process variables-Curing time- Mould temperature and Pressure requirements-preforms and preheating- common moulding faults and their correction-Finishing of moulded product.

Fundamental principles of transfer moulding-advantages over compression moulding-Equipment used- pressures requirements -Line pressures- Injection ram pressure-clamping-Heating requirements-Moulding faults - causes and remedies.

Module – II

Extrusion, Blow moulding, Thermoforming

Basic principles of extrusion – Types of extruders, extruder parts- polymer flow mechanism, die entry effects and exit instabilities-melt fracture & Bambooing. Factors affecting the output of an extruder, process variables in extrusion- downstream equipments for the production of films, blown film, cast film/slot film, BO film, co extruded film. Tube/pipe-sizing take off equipment, extrusion coating, wire & cable covering

Injection and extrusion blow moulding processes, accumulation blow moulding-processing parameters- materials requirements -blow moulding machine features and operation -faults, causes and remedies-parison programming, blow moulding of difficult articles like fuel tanks, odd shaped containers with handles, limitation in blow moulding, Basic principles and types of thermoforming processes, Thermoforming moulds-processing parameters—faults, causes and remedies.

Module – III

Calendaring, Rotational molding and FRP & Laminates (12 hr)

Calendaring - principle and process description- types of calendar units -design of calendar roll, Heating and temp control, roll crown, roll crossing and roll bending - calendaring sheets and films, embossing, coating and lamination by calendar, comparison between calendaring and extrusion.

Introduction-principle-process-machinery used-materials-moulds process parameters-merits & demerits of rotomolding.

Introduction, FRP Processing methods- hand lay up-spray up -vacuum bag & pressure bag moulding, filament welding – pultrusion – pulforming- matched die moulding.

Text Book

1. *Injection Molding Theory & Practice , Irvin I. Rubin, Wiley-Interscience (1973)*
2. *Injection Molding Hand Book Third Ed., D.V Rosato, D.V. Rosato & M.G. Rosato, Kluwer academic publishers (2000)*
3. *Plastics: Material & Processing, A. Brent Strong, Third Ed., Prentice Hall (2005)*

Reference Book:

1. *A Guide to Injection Molding of Plastics, P.C. Bolur, allied Publishers (2000)*
2. *Development in Injection Molding, Ed. Whelan, Elsevier (1985)*
3. *Plastics Materials & Processing – S.S.Schwartz and S.H.Goodman, Nostrand Reinhold (1982)*
4. *Injection Molding, A.S. Athalye, second Ed. (1997).*
5. *INJECTION MOULDING OF PLASTICS:A USER GUIDE Klockner Winsor India Ltd (1994)*
6. *Innovation in Polymer Processing - By Stevenson*
7. *Extrusion The definitive Processing Guide and Hand Book - By Giles, H.H & Others*
8. *Compression Molding - By Iyesew, A.I*
9. *Polymer Extrusion - By Rauwedaal, Chris*
10. *Thermoforming - By James & Throne*
11. *Basic Principle of rotational molding - By Crawford, R.J & Throne, J.L*
12. *Basic Principle of Rotational Molding - By Bruins*
13. *Basic Principle of Thermoforming - By Brycle, D.M*
14. *Plastics Injection Molding - By Brycle, D.M*
15. *Injection molding of Plastics component - By Bown John*
16. *Plastics Mold Design Vol.1 Compression & Transfer Moulds - By Bebb*
17. *Plastics forming - By Beadle*
18. *Calendering of Plastics - By Elden & Swan*