PLPC3003 PLASTICS MOULD & DIE DESIGN (3-0-0)

Course Objectives:
This course enables the students to: Learn about the design of injection mould and its various parts, the design of compression & transfer mould and its various parts, the design of blow mould and its various parts, and the design of extrusion dies and its various parts. Also, they can understand the concept of different types of mould fabrication & selection of materials for various parts of mould.
Syllabus

Module-I: Basics of Engineering Drawing (06 Hours)
Orthographic projection-Projection of solids—vertical and horizontal surfaces-Inclined Surfaces-Curved Surfaces-Sectional views and assembly drawing.

Module-II: Product Design (08 Hours)
Basic Principles-Shrinkage-Flash lines-Undercuts-suggested Wall thickness-Draft-Tolerance-Moulded holes-threads-radius- moulded hinges-integral hinge-snap fits - product design thumb rules - case studies and product design.

Module-III: Moulding Features (07 Hours)
Parting line-Construction of core and cavity -types of gate -types of ejection-Mould temperature control - cooling - Mould alignment Mould ancillary parts.

Module-IV: Mould Design (09 Hours)
Types of moulds-two plate - three plate - split moulds - Machine selection-Principles of shrinkage allowances-materials for mould parts-life of mould-mould maintenance-case studies on mould design. Injection Moulds for threaded components – automatic unscrewing – various unscrewing methods.

Module-V: Die Design (10 Hours)
Extrusion die design–Construction features of an extruder, Process, Characteristics of Polymer melt, Die geometry, Die head Pressure, characteristics of land length to Profile thickness Extrudate die swell, Die materials, Classification of dies- Dies for Solid Section, Dies for Hollow Profiles, Blown film dies, Flat film dies, Parison dies, Wire and cable Coating dies, Spiral mandrel die, Fish tail die, Adjustable Core die.

Course outcomes:
After the completion of this course, students will be able to:
CO1: Remember: Able to list the various parts of moulds and its design
CO2: Understand: Able to differentiate about different types of mould & its fabrication
CO3: Apply: Able to apply knowledge in selection of mould for different processing techniques such as injection, compression, blow and extrusion process
CO4: Create: Able to design various parts of mould, screw or die
CO5: Evaluate: Able to recommend the type the mould for a product

Books:
1. Pye, R.G.W Injection Mould Design for Thermoplastic
2. Plastics Product Design & Process Engineering - By Belofsky, Harold
3. Plastics Moulds & Dies - By Sors, & Others