DISCIPLINE SPECIFIC ELECTIVE COURSES (DSE-8)

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course
		Lecture	Tutorial	Practical/ Practice		
ENGINEERING DRAWING & MOLD DESIGN	4	3	0	1	Class 12th with Physics, Chemistry	---

Learning objectives

- To understand the various planes of work pieces
- To learn about the various mold and their components
- To acquaint with the concepts of mold & die design and their key features

Learning outcomes

The Learning Objectives of this course are as follows:

After studying this paper, students will be able to

- Explain about the graphics design
- Apply design features in structure of injection molds
- Apply design features in structure of extrusion dies

SYLLABUS OF DSE-8

THEORY COMPONENT-

UNIT 1 (18 Hours)

INTRODUCTION & PROJECTIONS OF PLANES, POLYHEDRA SOLIDS AND SOLIDS OF REVOLUTION

Introduction of Drawing instruments, sheet layouts lines, lettering and Dimensioning scales, various types of projections, First and Third angle systems of orthographic projections. Projection of Points in different quadrants: parallel to one reference plane, inclined to one plane but perpendicular to the other, inclined to both reference planes. Projections of Polyhedra Solids and Solids of Revolution – in simple positions with axis perpendicular to a plane, with

axis parallel to both planes, with axis parallel to one plane and inclined to the other, Projections of sections of Prisms, Pyramids, Cylinders and Cones.

UNIT 2: (12 Hours)

MOLD DESIGNING AND MAKING

Materials selection for mold and die, mold making processes: casting, electro deposition, cold hobbing, pressure casting, spark machining. Tool room machines and their application: CNC machines-CNC EDM-CNC, Milling- CNC. Basis structure and feed system of mould: core, cavity, runner, gates, bolster, and cooling unit.

UNIT 3: (15 Hours)

EJECTION SYSTEM & UNDER CUTS

Ejector grid, ejector plate assembly, ejection techniques, ejection from fixed half and sprue pullers, Form pin, split cores, side cores, stripping internal undercuts, molds for threaded components. Daylight molds–general, undercut, formin, double & triple daylight mold

PRACTICAL COMPONENT (30 Hours)

- Lines, lettering & Dimension (Sketch Book): Scale-representative Fraction, Plan scale, Diagonal Scale, Vernier scales (In sheet), comparative Scale, & scale of chords (Sketch Book)
- Geometric conception, caners used in drawing practice. Conic Section: Construction of Ellipse, Parabola & Hyperbola by different methods (In sheet)
- Construction of cycloid, Epicycloids, Hypocycloid and Involutes (In sheet) Archimedean and Logarithmic spiral, (Sketch book)
- Type Projection, Orthographic Projection: First Angle and third Angle Projection (Sketch Book)
- Projection of Straight lines, different position of straight lines, methods for determining True length, true inclinations and Traces of straight lines (Four problems in sheet and three problems in Sketch Book)
- Projection of Planes: Different positions of Plane lamina like.: - Regular polygon, circle three of planes (Four problems in Drawing sheet and three problems in Sketch Book).
- Demonstration software used in mold and die design (Auto CAD, solid works, etc.)

- To design and validate well labelled mold from clay/POP/resin and prepare plastic products.
- Demonstration of Lathe, milling, CNC and wire cutting machine
- Tool room/industrial visit

ESSENTIAL/RECOMMENDED READINGS

- Engineering Drawing, Basant Agarwal & CM Agrawal, Tata McGraw Hill.
- Engineering Drawing Geometrical Drawing, P.S. Gill, S.K. Katara & Sons.
- Engineering Drawing, Dhanarajay A Jolhe, Tata McGraw Hill.
- Pye R.G.W., (2000) Injection mould design, Affiliated East West Press Pvt. Ltd.
- Strong A.B., (2005) Plastics: Materials & Processing, Prentice Hall.
- Rosato D.V., Rosato D.V., (2000) Injection Moulding Handbook, CBS Publisher.

SUGGESTIVE READINGS

- Engineering Drawing, N.D. Bhatt, Charotar Publishing House Pvt. Ltd.
- Morton-Jones D.H., (2007) Polymer Processing, Chapman & Hall.
- Crawford R.J., (1998) Plastic Engg, Butterworth-Heinemann.
- Rees H., (1995) Mould Engineering, Hanser Publisher.

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.