COURSE NAME : TOOL DESIGN
COURSE CODE : 6112
SEMESTER :6
COURSE CATEGORY : A
PERIODS / WEEK : 6
PERIODS/SEMESTER : 90
CREDITS : 5

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	Design of guide plate tools Design of blanking tool with die set Design of fine blanking die Design of fine blanking die.	22
2	Design of progressive tools	23
3	Design of compound tool, bending tools, drawing to	22
4	Design of injection mould. Design of compression moulds& transfer mould Design of die casting dies.	23
	Total	90

COURSE OUTCOMES

On the completion of the course the student shall be able to:

1.Understand design different types of guide plate tools.

2.Know the design of blanking tool with die set.

3.Know the design of Fine blanking die.

4.Understand design of progressive tool.

5.Know the design of compound tool.

6.Understand different types of bending tool design.

7.Comprehend design aspects of drawing tool.

8. Understand design of injection mould.

9. Know compression mould design.

10. Appreciate the design aspects of die casting dies.

SPECIFIC OUTCOMES

MODULE-I

1.1.0 Understand design different types of guide plate tools

1.1.1 List the type of guide plate tools.

1.1.2 Explain the method of designing single guide plate tool.

1.1.3 Design a progressive guide plate tool.

1.2.0 Know the design of blanking tool with die set

1.2.1 State the die set materials.

1.2.2 Identity the die set components.

1.2.3 Draw blanking tool by using standard die set.

1.3.0 Analyze design of Fine blanking die

1.3.1 Define fine blanking.

1.3.2 Describe the elements of fine blanking tool.

1.3.3 Design fine blanking tool.

MODULE-II

2.1.0 Understand design of progressive tool

2.1.1 Draw single stage progressive tool incorporating fixed stop.

2.1.2 Design multi stage progressive tool by incorporating travelling Stripper and fixed stop.

2.1.3 Draw multi stage progressive tools with cut off punches and Parting off punches.

2.1.4 Design multi stage progressive tool incorporating side cutter and stock lifters.

MODULE-III

3.1.0 Analyze the design of compound tool

3.1.1 Draw the design of compound tool with direct knockout.

3.1.2Design a compound tool with indirect knockout.

3.2.0 Understand different types of bending tool design

3.2.1 State the design principle of 'V' bending tool.

3.2.2 Design 'U' bending tool.

3.2.3 Identify 'L' bending tool.

3.2.4 List the steps of designing curling tool and forming tool.

3.3.0 Analyze the design aspects of drawing tool

3.3.1 Justify the design of deep draw tool.

3.3.2Design inverted draw tool.

3.3.3 Derive the equation to find the blank holding force calculation.

MODULE-IV

4.1.0 Understand design of injection mould

4.1.1 State the hand injection mould designing with single cavity ejection mould.

4.1.2 Draw and design multi cavity injection mould.

4.1.3 Design injection mould with two plate mould.

4.1.4Identify the design of injection mould by incorporating different Injection moulds.

4.1.5 Design of injection mould by incorporating different feed arrangements.

4.2.0 Know compression mould design

4.2.1Design of compression mould showing horizontal flash.

4.2.2 Design of compression mould showing vertical flash.

4.3.1Draw a pot transfer mould with proportions.

4.3.2 List the factors governing the design of a plunger transfer mould.

4.4.0 Apply the design aspects of die casting dies

4.4.1 Explain with sketches the design of cold chamber die casting dies.

4.4.2 Describe with the help of sketches, the design aspects of hot chamber die casting system.

CONTENT DETAILS

MODULE-I

Design of Guide Plate Tool – Single stage – Progressive, Design of fine Blanking tool.

MODULE – II

Design of Progressive Tools, Single stage incorporating fixed stop, Multi stage incorporating one or more of the following fixtures:-

Travelling stripper, Cut off punches, parting of punches, Side cutter, Stock lifters&, fixed stop.

MODULE– III

Design of Compound tools - With Direct knock out – with indirect knockout.

Design of Bending Tools :- V-Bending Tool, U-Bending Tool, L-Bending Tool, curling tool, forming tool, Bending stress – calculation, Bending radius – calculation Design of Drawing tool , Deep draw tool, Inverted draw tool

Factors to be considered while designing calculation of drawing force - calculation for cylindrical cup drawing press capacity, Blank holding force –calculation.

MODULE– IV

Design of Injection moulds, Hand injection moulds – single cavity injection mould, multi cavity injection mould., Two plate injection mould, Design of moulds incorporating different type of ejection – different types of feed arrangements. Design of Compression moulds: - For component showing Horizontal flash, For component showing vertical flash .Design of Transfer mould:- Pot transfer mould – plunger transfer mould. Design of die-casting dies: For cold chamber system – for hot chamber system.

REFERENCE BOOKS

1. Jigs and Fixtures - Hiran.E.Grant
2. Jigs and Fixtures - Joshi
3. Fundamentals of Tool design - ASTME
4. Introduction to Injection mould design - Pye
5. Tool design - Donaldson
6. Production Engineering - P.C.Sharma
7. Press Tools: Design and Construction - Joshi.P.H.
8. Machine tools and tool design - P.C Sharma