LESSON PLAN

SUB: TOOLS ENGG.

BRANCH:- MECHANICAL ENGG.

SEMESTER: 4TH
NAME OF FACULTY: ER.SAGAR KUMAR BEHERA

GOVERNMENT POLYTECHNIC, BHADRAK

SESSION:2025-26

Hod ,Mechanical

Academic Co-ordinator

Principal
Govt. Polytechnic, Bhadrak

Discipline: MECHANICAL	Semester 4TH	Name of the Teaching Faculty ER.SAGAR KUMAR BEHERA Lecturer Stage-II,Mechanical Engineering
Subject: TOOLS ENGINEERING	No. of days/perweek class allotted: 3	Semester From date: 22/12/2025 To date:18-04-26 No of weeks: 15
Week	**Class Day**	**Theory Topics:**
1st	1st	Metal Cutting: Mechanics of Metal cutting; requirements of tools
	2nd	cutting forces; types of chips; chip thickness ratio;
	3rd	shear angle ; simple numerical only; types of metal cutting process; orthogonal; oblique and form cutting;
2nd	1st	shear angle ; simple numerical only; types of metal cutting process; orthogonal; oblique and form cutting;
	2nd	Cutting fluids: types; characteristics
	3rd	Cutting fluids: types; characteristics
3rd	1st	applications. Tool wear: Types of wear;
	2nd	applications. Tool wear: Types of wear;
	3rd	Tool life; Tool life equations
4th	1st	Tool life; Tool life equations
	2nd	Machinability: definition; factors affecting machinability;
	3rd	Machinability: definition; factors affecting machinability;
5th	1st	machinability index. Tool materials:
	2nd	**CLASS TEST - 1**
	3rd	machinability index. Tool materials:
6th	1st	Types; characteristics; applications; Heat treatment of tool steels;
	2nd	Types; characteristics; applications; Heat treatment of tool steels;
	3rd	Specification of carbide tips;
7th	1st	Specification of carbide tips;
	2nd	Types of ceramic coatings. Cutting Tool Geometry: Single point cutting tool
	3rd	drills; reamers; milling; cutters.

8th	1st	Types of dies and construction
	2nd	Types of dies and construction: Simple Die; Compound Die
	3rd	Types of dies and construction: Simple Die; Compound Die; Progressive Die
9th	1st	Types of dies and construction: Simple Die; Compound Die; Progressive Die; Combination Die.
	2nd	Punch & Die mountings: pilots; strippers; misfeed detectors; Pressure Pads; Knock outs; stock guide; Feed-Stop; guide bush; guide pins.
	3rd	Punch & Die mountings: pilots; strippers; misfeed detectors; Pressure Pads; Knock outs; stock guide; Feed-Stop; guide bush; guide pins.
10th	1st	Punch & Die mountings: pilots; strippers; misfeed detectors; Pressure Pads; Knock outs; stock guide; Feed-Stop; guide bush; guide pins.
	2nd	Punch & Die mountings: pilots; strippers; misfeed detectors; Pressure Pads; Knock outs; stock guide; Feed-Stop; guide bush; guide pins.
	3rd	**CLASS TEST - 2**
11th	1st	Die Design Fundamentals: Die Operations;
	2nd	Die Design Fundamentals: Die Operations; blanking; piercing;
	3rd	Die Design Fundamentals: Die Operations; blanking; piercing; shearing; cropping;
12th	1st	Die Design Fundamentals: Die Operations; blanking; piercing; shearing; cropping; notchng; lancing; coining
	2nd	Die Design Fundamentals: Die Operations; blanking; piercing; shearing; cropping; notchng; lancing; coining; embossing; stamping; curling; drawing;
	3rd	Die Design Fundamentals: Die Operations; blanking; piercing; shearing; cropping; notchng; lancing; coining; embossing; stamping; curling; drawing; bending; forming;
13th	1st	Die Design Fundamentals: Die Operations; blanking; piercing; shearing; cropping; notchng; lancing; coining; embossing; stamping; curling; drawing; bending; forming; Die set; Die shoe; Die area
	2nd	Die set; Die shoe; Die area; Calculation of clearances on die and punch for blanking and piercing dies; Strip layout; Calculation of material utilization factor.
	3rd	Die set; Die shoe; Die area; Calculation of clearances on die and punch for blanking and piercing dies; Strip layout; Calculation of material utilization factor.
14th	1st	Die set; Die shoe; Die area; Calculation of clearances on die and punch for blanking and piercing dies; Strip layout; Calculation of material utilization factor.
	2nd	Forming Dies: Bending methods; Bending Dies; bend allowance; spring back; spanking; bending pressure; pressure pads; development of blank length.

	3rd	Drawing: operations; Metal flow during drawing; Calculation of Drawing blank size; variables affecting metal flow during drawing;
15th	1st	single action and double action dies; combination dies.
	2nd	Fundamentals of other Tools: Constructional features of - Pressure Die casting dies; metal extrusion dies; injection molding dies; forging dies; plastic extrusion dies.
	3rd	Fundamentals of other Tools: Constructional features of - Pressure Die casting dies; metal extrusion dies; injection molding dies; forging dies; plastic extrusion dies.

Behera
20/12/2025

ER.SAGAR KUMAR BEHERA

Lecturer Stage-II Mechanical