

# LESSON PLAN

**SUB: TOOLS ENGG.**

**BRANCH:- MECHANICAL ENGG.**

**SEMESTER: 4TH**

**NAME OF FACULTY: ER.SAGAR KUMAR BEHERA**

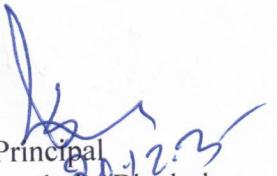


**GOVERNMENT POLYTECHNIC,  
BHADRAK**

**SESSION:2025-26**

  
Hod ,Mechanical

  
Academic Co-ordinator

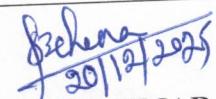
  
Principal  
Govt. Polytechnic, Bhadrak

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



8 <sup>th</sup>	1 <sup>st</sup>	Types of dies and construction
	2 <sup>nd</sup>	Types of dies and construction: Simple Die; Compound Die
	3 <sup>rd</sup>	Types of dies and construction: Simple Die; Compound Die; Progressive Die
9 <sup>th</sup>	1 <sup>st</sup>	Types of dies and construction: Simple Die; Compound Die; Progressive Die; Combination Die.
	2 <sup>nd</sup>	Punch & Die mountings: pilots; strippers; misfeed detectors; Pressure Pads; Knock outs; stock guide; Feed-Stop; guide bush; guide pins.
	3 <sup>rd</sup>	Punch & Die mountings: pilots; strippers; misfeed detectors; Pressure Pads; Knock outs; stock guide; Feed-Stop; guide bush; guide pins.
10 <sup>th</sup>	1 <sup>st</sup>	Punch & Die mountings: pilots; strippers; misfeed detectors; Pressure Pads; Knock outs; stock guide; Feed-Stop; guide bush; guide pins.
	2 <sup>nd</sup>	Punch & Die mountings: pilots; strippers; misfeed detectors; Pressure Pads; Knock outs; stock guide; Feed-Stop; guide bush; guide pins.
	3 <sup>rd</sup>	<b>CLASS TEST - 2</b>
11 <sup>th</sup>	1 <sup>st</sup>	Die Design Fundamentals: Die Operations;
	2 <sup>nd</sup>	Die Design Fundamentals: Die Operations; blanking; piercing;
	3 <sup>rd</sup>	Die Design Fundamentals: Die Operations; blanking; piercing; shearing; cropping;
12 <sup>th</sup>	1 <sup>st</sup>	Die Design Fundamentals: Die Operations; blanking; piercing; shearing; cropping; notching; lancing; coining
	2 <sup>nd</sup>	Die Design Fundamentals: Die Operations; blanking; piercing; shearing; cropping; notching; lancing; coining; embossing; stamping; curling; drawing;
	3 <sup>rd</sup>	Die Design Fundamentals: Die Operations; blanking; piercing; shearing; cropping; notching; lancing; coining; embossing; stamping; curling; drawing; bending; forming;
13 <sup>th</sup>	1 <sup>st</sup>	Die Design Fundamentals: Die Operations; blanking; piercing; shearing; cropping; notching; lancing; coining; embossing; stamping; curling; drawing; bending; forming; Die set; Die shoe; Die area
	2 <sup>nd</sup>	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.
	3 <sup>rd</sup>	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.
14 <sup>th</sup>	1 <sup>st</sup>	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.
	2 <sup>nd</sup>	Forming Dies: Bending methods; Bending Dies; bend allowance; spring back; spanning; bending pressure; pressure pads; development of blank length.

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

  
 ER.SAGAR KUMAR BEHERA  
 Lecturer Stage-II Mechanical