

**GOVERNMENT CO-ED POLYTECHNIC, JAGDALPUR
BASTAR (C.G)
DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN**

Session: - **APRIL-MAY 2025**

Semester: - **6th**

Session starts date as per University Calendar: **-06-01-2025**

Course Name: - **Basic Industrial Engineering and Production Management**

Course Code: - **2037671(037)**

Name of Subject teacher: - **PRAVEEN KUMAR HIRWANI**

CO-1 Use relevant work study procedure to increase the productivity.

Class Room Instruction (CI)	No. of Periods	Laboratory Instruction (LI)	No. of Periods	Remark
1.0 Productivity and Work Study:				
1.1 Introduction to Industry and Industrial Engineering	01			
1.2 Scope and role of industrial engineering, fields of application.	01			
1.3 Production and productivity, Production systems and their impact on productivity, significance and benefits of higher productivity.	02			
1.4 Long term and short-term factors affecting productivity, Productivity cycle.	01			
1.5 Objectives and application of work study, Basic procedure and techniques of work study, Human factors in work study.	02			

Number of periods planned (CI + LI): 07

Number of periods actually taken:

CO-2 Use relevant method and time study techniques in industry.

Class Room Instruction (CI)	No. of Periods	Laboratory Instruction (LI)	No. of Periods	Remark
2.0 Method Study and Time Study: 2.1 Definition, objectives of method study	01			
2.2 Basic procedures and Recording techniques of method study.	01			
2.3 Operation process chart, flow process chart, man machine chart, Flow diagrams, String Diagrams, two hand process charts	01			
2.4 Motion economy principles, Therbligs, cycle graph and chrono cycle graph. Work Measurement.	02			
2.5 Time Study: selection and timing the job, rating, allowances, Numerical on Normal and standard time calculation.	02			

Number of periods planned (CI + LI): 07

Number of periods actually taken:

CO-3 Analyze the behaviour of industrial systems.

Class Room Instruction (CI)	No. of Periods	Laboratory Instruction (LI)	No. of Periods	Remark
3.0 Reliability and Maintainability: 3.1 Need for Maintainability Maintenance and Reliability 3.2 Reliability, availability and maintainability terms and definitions	01			
3.3 Reliability: The reliability function, mean time to failure, Hazard rate function,	03			

<p>bath tub curve, conditional reliability</p> <p>3.4 Reliability Model: constant failure rate model, Time dependent failures model, Weibull Distribution, normal distribution</p> <p>3.5 Reliability system: Serial configuration, parallel configuration, Combined series –parallel configuration system.</p>				
<p>3.6 Reliability Evaluation Tools:</p> <p>Failure Modes and Effect Analysis (FMEA), Network Reduction</p> <p>3.7 Maintainability</p> <p>Analysis of downtime</p> <p>The Repair time distribution, Maintainability Function for Exponential Distribution, Rayleigh Distribution, Weibull Distribution.</p>	02			
<p>3.8 Maintainability Design Considerations, Fault Tree Analysis, Cause and Effect Diagram, Failure Modes Effect and Critically Analysis (FMECA)</p> <p>3.9 Preventive maintenance and replacement, total productive maintenance, Corrective Maintenance – concept and applications, examples</p>	01			
<p>Number of periods planned (CI + LI): 07</p> <p>Number of periods actually taken:</p>				
<p>CO-4 Select relevant material handling system and plant layout for industry.</p>				

Class Room Instruction (CI)	No. of Periods	Laboratory Instruction (LI)	No. of Periods	Remark
4.0 Material Handling and Plant Layout: 4.1 Importance and its effect on productivity, Requirements of good material handling system, Classification and selection of material handling equipment.	02			
4.2 Principles of economic material handling Hoisting equipment - forklift truck, Cranes- mobile motor cranes, overhead cranes, travelling bridges crane. Derrick crane. Whirler crane Conveying equipment - Package conveyors, gravity roller conveyors, screw conveyors, flight or scraper conveyors, bucket conveyors, bucket elevators, belt conveyors, and pneumatic conveyors.	03			
4.3 Requirements of good layout, effect of bad layout, Factors affecting plant layout, Types of layouts, Advantages and limitations of each type of layout, Selection of layout, factors affecting the plant location.	02			
Number of periods planned (CI + LI): 07				
Number of periods actually taken:				
CO-5 Use relevant charts for production planning and control in industry.				
Class Room Instruction (CI)	No. of Periods	Laboratory Instruction (LI)	No. of Periods	Remark
5.0 Production	02			

<p>Planning and Control: 5.1 Production system, concept of planning, meaning of PPC, Classification and characteristics of each type, Function of and place of PPC in an organization, Production and consumption rate</p>				
<p>5.2 Job, Batch and Mass production, Batch size, Buffer stock, Production cost components, Concept of production scheduling. Difference between Loading and Scheduling, 5.3 Gantt chart scheduling, advantages and preparation of GANTT chart.</p>	02			
<p>Statistical Quality Control charts 5.4 Definition of quality and total quality, Three stages of quality, quality control and SQC, 5.5 Difference between inspection and Quality control, Concept of variability natural variation, its importance to quality control, classification of quality characteristics 5.6 Basic tools of S.Q.C. and their applications, Frequency distribution, measures of central tendency and dispersion, their need and calculations</p>	02			
<p>5.7 Normal curve: Definition, characteristics,</p>	02			

<p>calculation of area under normal curve and its applications.</p> <p>5.8 Statistical basic for control charts for variables, Construction of X and R charts- their interpretation, Use of X and R chart in establishment of process capability, Limitation of X and R charts,</p>				
<p>5.9 Meaning, use and advantages of attributes, Calculation, Construction, interpretation and application of P, C charts,</p> <p>5.10 Need of calculating the revised values of mean, and control limits and their calculation.</p>	02			

Number of periods planned (CI + LI): 10

Number of periods actually taken:

CO-6 Apply material management and project planning techniques.

Class Room Instruction (CI)	No. of Periods	Laboratory Instruction (LI)	No. of Periods	Remark
<p>6.0 Material management and project planning:</p> <p>6.1 Nature, Purpose and objectives of basic functions of management, Authority and Responsibility, social responsibility of manager, ethics and management.</p>	01			
<p>6.2 Function of Material Management purchase system, Inventory, need and advantages of Inventory control, Different techniques of Inventory control -A.B.C. analysis, FIFO, LIFO,</p>	02			

Just in Time, Perpetual Inventory Management.				
6.3 Correlation, stock turn over, order quantity, Lead time purchase cycle, 6.4 Economic order Quantity, simple numerical problems, Safety stock 6.5 Stores Management-Definition and importance, Storing Procedure and store records.	02			
Project Planning 6.6 Network –meaning and objectives, Network formation, representation of activities and event on network, rules for drawing network diagram, Fulkerson’s rule 6.7 Different techniques- PERT and CPM, Dependency of activities, Dummy activities,	02			
6.8 Different Time estimates- Optimistic, Pessimistic and Most likely Time, ET, LT, EST, LST, LCT, ECT, Floats and Slacks and Network analysis on tabular form, Man power loading and calculation on load smoothing.	03			

Number of periods planned (CI + LI): 10

Number of periods actually taken:

Number of Total periods planned: 48

Number of Total periods actually taken:

Subject Teacher: PRAVEEN KUMAR HIRWANI

(Name and Signature)

HOD

(Department of Mechanical Engineering)

Principal

Govt Co-ed Polytechnic, Bastar



DEPARTMENT OF MECHANICAL ENGINEERING

GOVERNMENT CO-ED POLYTECHNIC, BASTAR

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LESSION PLAN

Name of the faculty :- Mr. AMAR XALXO

Semester :- 6th

Subject Name- Power Plant Engineering 2037672(037)

Lesson Plan Duration (L+P+T) :- 80Hrs (From Jan. To June. 2025)

S.No.	No. Of Periods	Topic Name	Practicals
	(Approx. Hrs: L+P+T=08)	Unit 1.0 Steam Power Plant	
1	2	Power plant : General layout of modern thermal power plant, Site selection, Presents status of power generation in India, Elements of power plant, function of each element, steam condition and dryness fraction.	
2	3	Rankine cycle: Representation on PV, TS, HS plane, efficiency of Rankine cycle, Revision & improvement of thermal efficiency of Rankine cycle by lowering exhaust pressure, increasing boiler pressure and superheating of steam. Numerical problems.	
3	1	Reheat cycle- representation on T-S and H-S Planes, flow diagram and advantages.	
4	1	Simple regenerating cycle Flow diagram, representation on T-S and H-S plants, bleeding and feed power heating and pumping, advantages of regenerative cycle.	
5	1	Power station- Types of power station such as central power station, industrial power station, captive power station, advantages, and classification of power station on the basis of prime-movers.	
	(Approx. Hrs: L+P+T=08)	Unit 2.0 Elements of power plant	
1	3	Steam Generators: Classification according to working pressure. (a) Low pressure boilers- Cocharn, Lancashire and locomotive boilers (b) High pressure boilers in modern steam power plants such as Velox, Benson, La-mont, Leoffler, supercritical boilers.	
2	2	(a) Boiler mountings- Safety valves, water level indicator, pressure gauge, blow off cock etc. (b) Accessories – super heater, economizer, pre heater and draft equipment. Superheat control methods, Pulverized fuel and necessity, storing systems etc.	

3	2	Steam Prime mover Steam nozzle-types, Velocity of steam at outlet, Weight of discharge, Area of cross section at throat and outlet, Critical pressure ratio, Nozzle efficiency, Concept of prime mover, Steam turbine – working principle , method of compounding and governing, losses in steam turbines.
4	1	Condensing Unit -Functions of Steam condenser and its type's jet and surface, Limitations and advantages of steam condenser, Elements of condensing unit, cooling towers.
	(Approx. Hrs: L+P+T=08)	Unit 3.0 Gas & Diesel Power Plants
1	2	Gas Turbine Power Plants- Brayton cycle, classification of Brayton or Joule Cycle, Open and Close cycle, representation of cycle on P.V. and T.S. diagram.
2	3	Thermal efficiency in terms of terminal temperature and pressure, effect of pressure ratio on thermal efficiency, Advantages and disadvantages of open and close cycle gas turbines, Important components of gas turbine power plant, Methods of improving thermal efficiency, Essential auxiliaries and controls of a gas turbine power plants, Fuels for gas turbines.
3	3	Diesel Engine Power Plants- Diesel power plant layout, Functions & components of diesel power plant , Diesel power plant systems such as –Cooling and lubrication system, fuel injection system, solid injection system – common rail system, individual pump system, distribution system, data recording.
	(Approx. Hrs: L+P+T=10)	Unit 4.0 Nuclear Power Station
1	3	Evolution of nuclear energy from atoms by fission and fusion. Chain reactions, fission materials, types of reactors, gas cooled, boiling water liquid, metal cooled and fast reactor,
2	2	Arrangements of various station, steam cycles and boilers coolant heat exchangers, Reactor control, Reactor shielding and safety methods.
3	3	Setting of Nuclear plants: Site evaluation Stages, Site Rejection Criteria, Earthquake, Geological criteria, Meteorological considerations, Flooding, Tsunami, Shoreline erosion, chemical explosion, Radiological impact study, Radioactivity pathways to humans, environmental Impact study.
4	2	Hazards in nuclear power station – units of radiations, safe and dangerous dozes of radiations, safety precautions in nuclear power station, Nuclear power plants in India.
	(Approx. Hrs: L+P+T=06)	Unit 5.0 Hydro Electric Power Plants
1	2	Potential power with reference to rainfall and catchments area, Water storage, element of hydro electric power stations.

2	2	Characteristics of hydraulic turbines, Comparison of the factors governing the cost of hydro, steam and diesel power stations.	
3	2	Selection of prime mover, speed and pressure regulation, methods of governing, starting and stopping of water turbines, operation of hydro turbines. Maintenance of hydropower plants	
	(Approx. Hrs: L+P+T=8)	Unit 6.0 Steam Power station Control and Economics	
1	2	Effect of load variation on shaft speed, steam admission, valve opening, steam flow rate, steam pressure and combustion control system.	
2	2	load variation, Control system (area system, centralized control system) Basic elements of control system, controls and instruments located in modern control station.	
3	4	Power plant economics -Concept of occurrence of fluctuating loads, Load curve and its significance, Definition and terminology of connected load, maximum demand, demand factor, average load, load factor, diversity factor, plant capacity factor, plant use factor, effect of variable load and remedies.	



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DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN

SESSION: APR - MAY 2025

Name of Faculty: Rakesh Kumar Ray

Subject: Computer Aided Modeling & Manufacturing

Subject Code: 2037674(037)

Semester: Diploma 6th Sem

Text Books CAD/CAM: Sareen Kuldeep

Introduction to NC/CNC Machines: Vishal S.

Ref. Books Computer Aided Manufacturing: Rao P N, Tiwari N K,
Kundra T

CNC Machines: Pabla B.S., Adithan M

TOTAL CLASS SCHEDULED:

79

TOTAL CLASS TAKEN:

83

Faculty Signature (Rakesh Kumar Ray)

HOD Signature

Principal
Govt. Co-Ed Polytechnic
Jagdalpur, Adawal

LECT. NO.	UNIT NO.	TOPIC TO BE COVERED	DATE OF LECTURE	REMARKS
		UNIT- Essential of CAD / CAM		
1	1	CAD definition, concept and need.	10.01.2025 - 25.01.2025	
2		CAD process and Functional areas of CAD.		
3		CAD Workstation types, functions		
4		CAD Workstation types configuration		
5		CAD Software: types, features, strengths and limitations		
6		CAM - concept and definition.		
7		NC Machine (Numerical Control Machine)		
8		CNC Machine (Computerized Numerical Control Machine) and		
9		DNC Machine (Direct Numerical Control Machine)		
10		NC / CNC / DNC concept, features and differences.		
11		NC machines: Advantages, limitations		
12		NC machines: selection criteria.		

LECT. NO.	UNIT NO.	TOPIC TO BE COVERED	DATE OF LECTURE	REMARKS
		UNIT-2 Computer aided Solid Modeling and Assembly		
13	2	Working in 3D environment	26.01.2025 - 15.02.2025	
14		Creating 3D Solid Models of simple machine parts		
15		Creating 3D Solid Models of complex machine parts		
16		Creating 3D Solid Models Extrude, Revolve 3D Commands.		
17		Creating 3D Solid Models Sweep, variable section sweep,		
18		Creating 3D Solid Models Draft 3D command		
19		Creating 3D Solid Models Blend or similar 3D commands.		
20		Part Editing tool: Trim, Extend, Erase		
21		Part Editing tool: Mirror, Chamfer, Round		
22		Part Editing tool: Copy, Move, Draft		
23		Part Editing tool: Boolean operations, patterns, etc.		
24		Parametric and non-parametric modeling concept,		
25		Parametric and non-parametric modeling differences and illustration.		
26		Preparation of assemblies using assembly commands.		
27	Introduction to Top down and bottom-up approach of assembly			

28		Exploded view: Explode the assembly		
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LECT. NO.	UNIT NO.	TOPIC TO BE COVERED	DATE OF LECTURE	REMARKS
		UNIT-3 Computer aided Drafting and Plotting		
29	3	Generate orthographic projections. All types of views	16.02.2025 - 28.02.2025	
30		Generate orthographic projections. front view, top view,		
31		Generate orthographic projections. side view, sectional views,		
32		Generate orthographic projections. isometric views, auxiliary views.		
33		Dimensioning Commands – Apply dimensions, dimensional tolerance.		
34		Dimensioning Commands – Apply geometrical tolerance.		
35		Preparation of assembly drawing using assembly feature		
36		Preparation of assembly drawing using assembly feature		
37		Explode view- Explode the assembly		
38		Explode view- Explode the assembly		
39		Working in Drafting mode.		
40		Bill of material- prepare part list table.		
41		Bill of material- prepare name plate.		
42		Page set up, Plot command.		

LECT. NO.	UNIT NO.	TOPIC TO BE COVERED	DATE OF LECTURE	REMARKS
		UNIT-4 CNC TURNING		
43	4	CNC Machine - types classification.	01.03.2025 - 25.03.2025	
44		CNC Machine - working and constructional features.		
45		Elements of CNC machine- types sketch working		
46		Importance of- slide ways, recirculating ball screw.		
47		Importance of- feedback devices (Transducer, Encoders)		
48		Automatic tool changer (ATC)		
49		Automatic pallet changer (APC)		
50		CNC Axes and motion nomenclature		
51		CNC Tooling- Tool presetting - Concepts		
52		CNC Tooling- Tool presetting - Concepts and Importance,		
53		Qualified tools- Definition need and advantages,		
54		Tool holder's types and applications.		
55		CNC Turning Centres- Features, axes nomenclature		
56		CNC Turning Centres- specification		
57		Work holding devices- Types working and applications,		
58		Tool holding and changing devices- types working and applications		
59		CNC Part programming- Programming format of part programme		
60		CNC Part programming- Programming structure of part programme		
61		ISO G and M codes for turning- Meaning and application of important codes		
62		Simple part programming for turning using ISO format having straight turning,		
63	Taper turning (Linear interpolation)			
64	convex/concave turning (circular interpolation)			

LECT. NO.	UNIT NO.	TOPIC TO BE COVERED	DATE OF LECTURE	REMARKS
		UNIT-5 CNC MILLING		
65	5	CNC Milling centres - Types, features	26.03.2025 - 20.04.2025	
66		CNC Milling centres - axes nomenclature specification,		
67		work holding devices- types working and application		
68		Tool holding and changing devices- types working and applications		
69		CNC Part programming- Programming format of part programme		
70		CNC Part programming- Programming structure of part programme		
71		ISO G and M codes for turning- Meaning and application of important codes		
72		Simple part programming for Milling using Iso format		
73		Importance, types, applications and format for - canned cycles		
74		Importance, types, applications and format for - macro, do loops, subroutine		
75		CNC Milling part programming using canned cycles		
76		CNC Milling part programming using macro, do loops, subroutine		
77		Need and importance of various compensations, tools radius compensations		
78	Need and importance of various compensations, tool, offsets			
79	Simple part programming using various compensation			

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DEPARTMENT OF ELECTRICAL ENGINEERING
LESSON PLAN SESSION-(April-May) 2025

NAME OF FACULTY : Tejeshvarya

SUBJECT : Entrepreneurship Development and Management

SUBJECT CODE : 2000673(037)

SEMESTER : Diploma (6th)Sem

TEXT BOOKS Entrepreneurial Development:Desai Vasa
 Entrepreneurship Development and small Business Enterprises:Charantimath M.

REF. BOOKS The Business Planning GUIDE:H.Bangs David
 Entrepreneurial Development:Sharma sangita

Serial NO.	UNIT	TOPIC TO BE COVERED	Expected no of lectures	REMARKS
Unit 1.0 Characteristics of entrepreneurs				
1	1			
2		1.1 Concept of entrepreneur and intrapreneur	1	
3		1.2 Benefits of becoming an intrapreneur/entrepreneur	1	
4		1.3 Scope of entrepreneurship in local and global market.	1	
5		1.4 Planning for establishment of an enterprise.	2	
6		1.5 Traits of successful intrapreneur/entrepreneur and passion, initiative, independent decision making, team work, assertiveness, persuasion, persistence, information seeking, commitment to work contract etc. SW analysis. Team work simulation.	3	
7		1.6 Trait of successful entrepreneur: calculated risk taking. Risk taking simulation exercise.	1	
8		1.7 Business opportunity Guidance	1	
Unit 2.0 Motivation Management				
9	2			
10		2.1 Motives, motivation and motivational cycle.	2	
11		2.2 Concept of Need for Achievement.	2	
12		2.3 Need for Achievement assessment through various tools.	1	
13		Ring toss game	1	
14		Boat making exercise	1	
15		Building block exercise	1	
16		TAT stories	1	
17		Who am I?	1	
18		2.4 Interpretation and action plan for self development.	1	
Unit 3.0 Management of Creativity. Check list of questions..				
19	3			
20		3.1 Creativity: Divergent thinking, creativity techniques. Six thinking hats.	3	
21		3.2 Innovation, types and applications Case study of innovative first generation entrepreneur	3	
22		3.3 Product life cycle, New product development process. Product development and innovation through creativity and innovation.	5	
Unit 4.0 Critical Resources				
23		4.1 Forms of business organization:		
24		Proprietorship,	1	
25		Partnership, Cooperative,	1	

Serial		TOPIC TO BE COVERED	EXPECTED NO OF PERIODS	REMARKS
27	4	Private, Public Ltd	1	
28		Company, Section 8	1	
29		company, LLP		
30		4.2 Institutional Support for entrepreneurship:	2	
31		MSMESI, CED, DTIC, CITCON, CSIDC, LUN, NSIC, KVIC, NABARD, Banks, SIDBI		
32		4.3 Entrepreneurship promotion schemes of centre and state.	1	
33		4.4 Marketing Mix, Market survey for project identification	2	
34		4.5 Inventory control, vendor development, material movement, store management.	2	
35		4.6 Manpower plan, hiring process, compensation, performance appraisal.	1	

		Unit 5.0 Sustainable business plan		
36	5	5.1 Format of business plan/techno-economic feasibility report.	3	
37		5.2 Demand and annual production target based on market survey.	1	
38		5.3 Outline production/service process.	1	
39		5.4 Land, building and machinery requirement. .	1	
40		5.5 Power, utilities and raw material requirement.	1	
41		5.6 Fixed capital, Working capital, Subsidy and Cost of Project	1	
42		5.7 Means of finance, calculation of interest.	1	
43		5.8 Profitability analysis, Break-even point.	1	
TOTAL SCHEDULED CLASSES: _53			Signature of Faculty	HOD Signature
TOTAL CLASSES TAKEN:				

5.4 Land, building and machinery requirement.

5.5 Power, utilities and raw material requirement.

5.6 Fixed capital, Working capital, Subsidy and Cost of Project.

5.7 Means of finance, calculation of interest.

5.8 Profitability analysis, Break-even point.

Entrepreneurial Development

Desai Vasant

Entrepreneurial Development

Sharma Sangita

Entrepreneurship Development and small Business Enterprises

Charantimath M.

The Business Planning GUIDE

H.Bangs David



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LESSON PLAN

DEPARTMENT OF MECHANICAL ENGINEERING

NAME OF FACULTY : SHAILESH SIDAR

SUBJECT : INDUSTRIAL MAINTENANCE & SAFETY

SUBJECT CODE : 2037675(037)

SEMESTER : DIPLOMA VI SEM

LECT. NO.	UNIT	TOPIC TO BE COVERED	DATE OF LECTURE TAKEN	REMARKS
		Unit 1.0 Fundamentals of industrial maintenance		
1	1	Definition and aim of Maintenance engineering..		
2		Primary and secondary functions and responsibility of maintenance department.		
3		Types of maintenance – Preventive, Periodic, Predictive, Condition based monitoring		
4		Types and applications of tools and equipments used for maintenance.		
5		Maintenance cost & its relation with replacement economy.		
6		Service life of equipment.		



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LESSON PLAN
 DEPARTMENT OF MECHANICAL ENGINEERING

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SUBJECT : INDUSTRIAL MAINTENANCE & SAFETY

SUBJECT CODE : 2037675(037)

SEMESTER : DIPLOMA VI SEM

Lect. No.	2	Unit 2.0 Preventive and Periodic Maintenance		
7		Periodic maintenance – concept and need.		
8		Degreasing, cleaning and repairing.		
9		Preventive maintenance - concept, need, steps and advantages.		
10		Maintenance and replacement schedules,		
11		Standard data for maintenance and replacement of parts		
12		Steps/procedure for periodic and preventive maintenance of: i machine tools		
13		ii. Pumps. iii. Air compressors.		
14		iv. Diesel generating (DG) sets.		
15		Repair cycle-concept and importance.		



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LESSON PLAN

DEPARTMENT OF MECHANICAL ENGINEERING

SESSION :-

NAME OF FACULTY : SHAILESH SIDAR

SUBJECT : INDUSTRIAL MAINTENANCE & SAFETY

SUBJECT CODE : 2037675(037)

SEMESTER : DIPLOMA VI SEM

Lect. No.		Unit 3.0 Wear and Corrosion		
16	3	Basic fundamentals of friction and Wear Mechanism.		
17		Wear- types, causes and their effects. Wear reduction methods		
18		Function, types and applications of Lubricants		
19		General sketch, working and applications of Lubrication methods. i. Screw down grease cup. ii. Pressure grease gun. iii. Splash lubrication.		
20		iv. Gravity lubrication. v. Wick feed lubrication. vi. Side feed lubrication. vii. Ring lubrication		
21		Definition, principle and factors affecting the corrosion.		
22		Types of corrosion. Corrosion prevention methods.		



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SUBJECT : INDUSTRIAL MAINTENANCE & SAFETY

SUBJECT CODE : 2037675(037)

SEMESTER : DIPLOMA VI SEM

Lect. No.		Unit 4.0 Fault tracing		
23	4	Fault tracing-concept and importance.		
24		Decision tree-concept, need and applications.		
25		Sequence of fault finding activities, show as decision tree.		
26		Draw decision tree for problems in machine tools, hydraulic, pneumatic, automotive, thermal and electrical equipment Pump		
27		Air compressor.		
28		Internal Combustion engine.		
29		Boiler.		
30		Electrical motors.		
31		Types of faults in machine tools and their general causes.		



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SUBJECT : INDUSTRIAL MAINTENANCE & SAFETY

SUBJECT CODE : 2037675(037)

SEMESTER : DIPLOMA VI SEM

Lect. No.		Unit 5.0 Recovery, Reconditioning and Retrofitting		
32		Definition of recovery, reconditioning and retrofitting.		
33		Methods of recovery and their applications.		
34		Selection criteria of recovery methods.		
35	5	Selection criteria of recovery methods.		
36		Reconditioning - process,		
37		features and advantages.		
38		Retrofitting - concept,		
39		need and applications.		



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SUBJECT CODE : 2037675(037)

SEMESTER : DIPLOMA VI SEM

Lect. No.	6	Unit 6.0 Industrial Safety and Safety Acts		
40		Need, Aim, Objective and Four E's of Industrial Safety.		
41		Mechanical and electrical hazards-types, causes and preventive steps/procedure		
42		Personal protective equipments, Survey the plant for locations and hazards		
43		Education and training in safety, Prevention causes and cost of accident, Industrial psychology in accident prevention and Safety trials		
44		Accident -causes, types, results and control, Accident reporting and Investigations.		
45		Features of Factory Act, Introduction of Explosive Act, Boiler Act and ESI Act, Workman's compensation Act		
46		Industrial hygiene and Occupational safety, Diseases prevention, Ergonomics, Occupational diseases, stress, fatigue, health Safety and the physical environment		
47		Engineering methods of controlling chemical hazards, safety and the physical environment Control of industrial noise and protection		

GOVERNMENT CO-ED POLYTECHNIC, JAGDALPUR
BASTAR(C.G)
DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN

Session: - **Apr-May 2025**

Semester: - **6th**

Session start date as per University Calendar: - **06.01.2025**

Course Name: - **Advanced Manufacturing Processes**

Course Code: - **2037682 (037)**

Name of Subject teacher: - **BHUPESH SAHU**

CO-1 Select the non-conventional machining process to produce complex machine components.

Class Room Instruction (CI)	No. of Periods	Laboratory Instruction (LI)	No. of Periods	Remark
1.1 Need of advance manufacturing, manufacturing trends and challenges, manufacturing aspects.		LE1.1 Prepare the job using electrical discharge machining.		
1.2 Types of non-conventional machining processes and energy source utilized.		LE1.2 Prepare the job using electrochemical machining.		
1.3 Working principle, setup, Process parameter Advantages, limitation and application and safe practices of- Electrical discharge machining (EDM), Wire Electrical discharge machining (WEDM), Electrochemical Machining (ECM), Plasma arc machining (PAM), Abrasive jet machining (AJM), Ultrasonic Machining (USM), Electron Beam Machining (EBM), Laser beam machining (Cutting)		LE1.3 Prepare a job using abrasive jet machining.		
		LE1.4 Prepare a job using Electron beam machining.		

Number of periods planned (CI + LI): 16

Number of periods actually taken:

CO-2 Explain the advancements in casting process.

Class Room Instruction (CI)	No. of Periods	Laboratory Instruction (LI)	No. of Periods	Remark
2.1 Metal casting basics, Gating and riser design.		LE2.1 Design a gating system for given application.		

2.2 Working principle, set up, process parameters, Advantages, limitations and applications of Evaporative pattern casing process (EPC), Centrifugal and pressure die casting, Slush casting, Hybrid EPC process, Vacuum EPC, Shell Molding Process.		LE2.2 Prepare a casting product using shell moulding process.		
		LE2.3 Prepare a casting product using high pressure die casting.		

Number of periods planned (CI + LI): 13

Number of periods actually taken:

CO-3 Explain different advanced welding and metal forming processes.

Class Room Instruction (CI)	No. of Periods	Laboratory Instruction (LI)	No. of Periods	Remark
3.1 Working principle, setup, Process parameter Advantages, limitation and application- Orbital TIG welding, Electron beam welding (EBW), Laser beam welding (LBW), ultrasonic welding. Industrial adhesive and Adhesive bonding.		LE3.1 Prepare a job of a given design using electron beam welding.		
3.2 Advanced Metal forming- High energy rate forming, Electro-magnetic forming, explosive forming, Electrohydraulic forming, Stretch forming, Contour roll forming.		LE3.2 Prepare a job of a given design using laser beam welding.		
		LE3.3 Prepare a job of a given design using Ultrasonic welding.		

Number of periods planned (CI + LI): 16

Number of periods actually taken:

CO-4 Select relevant machining process to produce gears.

Class Room Instruction (CI)	No. of Periods	Laboratory Instruction (LI)	No. of Periods	Remark
4.1 Types of gear and Gear manufacturing methods.		LE4.1 Perform gear shaping operation using pinion cutter.		
4.2 Gear Hobbing- Types and working principle of gear hobbing, Advantages, limitations and application.		LE4.2 Perform gear shaping operation using Rack cutter.		
4.3 Gear Shaping-Gear Shaping by pinion cutter, Gear Shaping by rack		LE4.3 Produce gear using hobbing process.		

cutter, Advantages, limitation and application of both the methods and comparison of gear hobbing and gear shaping.				
4.4 Gear Finishing methods- Need of gear finishing and different methods of gear finishing like: a) Gear shaving b) Gear grinding c) Gear burnishing d) Gear lapping e) Gear honing f) Gear tooth rounding				

Number of periods planned (CI + LI): 14

Number of periods actually taken:

CO-5 Apply recent trends in Computer Aided Manufacturing to produce components effectively.

Class Room Instruction (CI)	No. of Periods	Laboratory Instruction (LI)	No. of Periods	Remark
5.1 Additive manufacturing: 3D printing, Rapid prototyping.		LE5.1 Print a simple and a complex component modeled in LE2.1 and 2.2 of Computer Aided Modelling & Manufacturing course using 3D printer.		
5.2 Construction and working of 3D printer.		LE5.2 Prepare a simple program for manipulation of standard components using Robotic arm.		
5.3 Type and properties of material for 3D printer and Rapid prototyping machine.				
5.4 File format: STL (Stereo Lithography).				
5.5 3D printer software: part import, orientation, processing and printing.				
5.6 Computer Integrated Manufacturing (CIM): concept, definition, areas covered and benefits.				
5.7 Automation-Define, need of automation, high and low-cost automation, examples of automations.				
5.8 Types of Automation - Fixed (Hard) automation, programmable automations and Flexible automations (Soft).				
5.9 Group Technology concept, basis for developing part families, part classification and coding with example, concept of cellular				

manufacturing. Advantages and limitations.				
5.10 Flexible Manufacturing System (FMS): concept, evaluation, main elements and their functions, layout and its importance, applications.				
5.11 Robot: definition, terminology, classification and types.				
5.12 Components of Robot: manipulator, end effectors, actuators, sensors, controller, processor, software and applications.				

Number of periods planned (CI + LI): 21

Number of periods actually taken:

Number of Total periods planned: 80

Number of Total periods actually taken:

Subject Teacher: BHUPESH SAHU

(Name and Signature)

HOD

(Department of Mechanical Engineering)

Principal

Govt Co-ed Polytechnic, Bastar