

Academic Lesson Plan for MANUFACTUREING TECHNOLOGY(Summer-2024)		
Discipline: Mechanical Engineering	Semester: 4th	Name of Faculty: Chandrasekhar Dash
Subject:MANUFAC TUREING TECHNOLOGY	No. of days/per week Class Allotted: 4	Semester from: 16/01/2024
		No. of weeks:15
Week	Class Day	Theory Topics
1st	1st	1.0 Tool Materials
	2nd	Composition of various tool materials
	3rd	Physical properties& uses of such tool materials.
	4th	Physical properties& uses of such tool materials.
2nd	1st	2.1 Cutting Tools
	2nd	Cutting action of various and tools such as Chisel, hacksaw blade, dies and reamer
	3rd	Turning tool geometry and purpose of tool angle
	4th	Machining process parameters (Speed, feed and depth of cut)
3rd	1st	Coolants and lubricants in machining and purpose
	2nd	Coolants and lubricants purposes
	3rd	3.0 Lathe Machine
	4th	Construction and working of lathe and CNC lathe, Major components of a lathe and their function
	1st	Operations carried out in a lathe(Turning, thread cutting, taper turning, internal machining, parting off, facing, knurling), Safety measures during machining

4th	2nd	Capstan lathe Difference with respect to engine lathe Major components and their function Define multiple tool holders
	3rd	Turret Lathe
	4th	Difference with respect to capstan lathe
5th	1st	Turret Lathe Major components and their function
	2nd	Draw the tooling layout for preparation of a hexagonal bolt & bush
	3rd	4.0 Shaper
	4th	Potential application areas of a shaper machine Major components and their function
6th	1st	Explain the automatic feed mechanism
	2nd	Explain the construction & working of tool head
	3rd	Explain the quick return mechanism through sketch
	4th	State the specification of a shaping machine
7th	1st	5.0 Planning Machine
	2nd	Application area of a planer and its difference with respect to shaper
	3rd	Major components and their functions
	4th	The table drive mechanism
8th	1st	Working of tool and tool support
	2nd	Clamping of work through sketch.
	3rd	6.0 Milling Machine
	4th	Types of milling machine and operations performed by them and also same for CNC milling machine
9th	1st	Explain work holding attachment
	2nd	Construction & working of simple dividing head, universal dividing head
	3rd	Procedure of simple and compound indexing
	4th	Procedure of simple and compound indexing

10th	1st	Illustration of different indexing methods
	2nd	Illustration of different indexing methods
	3rd	7.0 Slotter
	4th	Introduction
11th	1st	Major components and their function
	2nd	Construction
	3rd	working of slotter machine
	4th	Tools used in slotter
12th	1st	8.0 Grinding
	2nd	Significance of grinding operations
	3rd	Manufacturing of grinding wheels
	4th	Criteria for selecting of grinding wheels
13th	1st	Specification of grinding wheels with example Working of Cylindrical Grinder
	2nd	Surface Grinder, Centreless Grinder
	3rd	9.0 Internal Machining operations
	4th	Working of Bench drilling machine
14th	1st	Pillar drilling machine Radial drilling machine
	2nd	Boring Basic Principle of Boring
	3rd	Different between Boring and drilling
	4th	Broaching Types of Broaching(pull type, push type) Advantages of Broaching and applications
15th	1st	10 Surface finish, lapping
	2nd	Definition of Surface finish explain their specific cutting.
	3rd	Revision
	4th	Revision

Chandrasekhar Dash

Academic Lesson Plan for ADVANCE MANUFACTURING PROCESSES (Summer-2024)

Discipline: Mechanical Engineering	Semester: 4th	Name of Faculty: Chandrasekhar Dash
Subject:ADVANCE MANUFACTURING PROCESSES	No. of days/per week Class Allotted: 4	Semester from: 16/01/2024
		No. of weeks:15
Week	Class Day	Theory Topics
1st	1st	1.0 Modern Machining Processes:
	2nd	Introduction – comparison with traditional machining
	3rd	Ultrasonic Machining: principle, Description of equipment, applications.
	4th	Electric Discharge Machining: Principle, Description of equipment, Dielectric fluid, tools
2nd	1st	Process parameters, Output characteristics, applications.
	2nd	Wire cut EDM: Principle, Description of equipment, controlling parameters; applications
	3rd	Abrasive Jet Machining: principle, description of equipment
	4th	Material removal rate, application
3rd	1st	Laser Beam Machining: principle, description of equipment
	2nd	Material removal rate, application
	3rd	Electro Chemical Machining: principle
	4th	description of equipment
4th	1st	Material removal rate, application
	2nd	Plasma Arc Machining
	3rd	principle, description of equipment, Material removal rate
	4th	Process parameters, performance characterization, Applications
5th	1st	Electron Beam Machining
	2nd	principle, description of equipment

	3rd	Material removal rate, Process parameters
	4th	performance characterization, Applications
6th	1st	2.0 Plastic Processing
	2nd	Processing of plastics
	3rd	Moulding processes: Injection moulding, Compression moulding
	4th	Transfer moulding
7th	1st	Extruding; Casting
	2nd	Calendering
	3rd	Fabrication methods-Sheet forming
	4th	Blow moulding
8th	1st	Laminating plastics (sheets, rods & tubes), Reinforcing
	2nd	Applications of Plastics.
	3rd	3.0 Additive Manufacturing Process
	4th	Introduction, Need for Additive Manufacturing
9th	1st	Fundamentals of Additive Manufacturing, AM Process Chain
	2nd	Advantages and Limitations of AM, Commonly used Terms
	3rd	Classification of AM process, Fundamental Automated Processes
	4th	Distinction between AM and CNC, other related technologies.
10th	1st	Application in Design, Aerospace Industry
	2nd	Automotive Industry, Jewelry Industry, Arts and Architecture
	3rd	RP Medical and Bioengineering Applications
	4th	Web Based Rapid Prototyping Systems
11th	1st	Concept of Flexible manufacturing process
	2nd	concurrent engineering
	3rd	production tools like capstan and turret lathes
	4th	rapid prototyping processes
12th	1st	Revision
	2nd	4.0 Special Purpose Machines (SPM)

12th	3rd	Concept, General elements of SPM
	4th	Concept, General elements of SPM
13th	1st	Productivity improvement by SPM
	2nd	Principles of SPM design
	3rd	Revision
	4th	Revision
14th	1st	5.0 Maintenance of Machine Tools
	2nd	Types of maintenance
	3rd	Repair cycle analysis
	4th	Repair complexity, Maintenance manual,
15th	1st	Maintenance records, Housekeeping
	2nd	Introduction to Total Productive Maintenance (TPM)
	3rd	Revision
	4th	Revision

Chandrasekhar Dash