

Lesson Plan

Name of the Faculty : Preeti
 Discipline : Mechanical Engg.
 Semester : 5th
 Subject : CNC MACHINE & AUTOMATION
 Lesson plan duration : 15weeks (from September,2023 to december,2023)

Week	Theory		Practical	
	Lecture Day	Topic (including assignments /tests)	Practical Day	Topic
Week 1 st	1 st	Introduction: Introduction to NC, Basic Components of NC, binary coding, MCU	1 st	Study of constructional detail of CNC lathe.
	2 nd	input devices, advantages /disadvantages of NC machines over conventional machines		
	3 rd	CNC & DNC, their types, their advantages, disadvantages and applications,		
Week 2 nd	1 st	selection of parts to be machined on CNC machines, Problems with conventional NC,	1 st	Study of constructional detail of CNC milling machine.
	2 nd	Rules for Axis identification, New developments in NC, PLC Control and its purpose		
	3 rd	Construction and Tooling- Design features, specification of CNC machines, use of slide ways,		
Week 3 rd	1 st	Balls, rollers and coatings, motor and lead screw, swarf removal	1 st	Practice
	2 nd	Safety and guarding devices		
	3 rd	Various cutting tools for CNC machines		
Week 4 th	1 st	Concept of CNC tool holder, different pallet systems	1 st	Study the constructional details and working of Automatic tool changer and Multiple pallets
	2 nd	Automatic tool changer system, management of a tool room.		
	3 rd	Revision		
Week 5 th	1 st	System Devices- Control System; Open Loop and Closed Loop System,	1 st	Develop a part programme for following lathe operations and make the job on CNC lathe. - Plain turning and facing operation

				- Taper turning operation - Circular interpolation
	2 nd	Concept of Actuators & its types		
	3 rd	Transducers & its types		
Week 6 th	1 st	Sensors & its types	1 st	Practice
	2 nd	Tachometer, LVDT,		
	3 rd	Opto-interrupters,		
Week 7 th	1 st	Potentiometers for linear position	1 st	Develop a part programme for the following milling operation and make the job on CNC milling - Plain milling - Slot milling
	2 nd	Potentiometers for angular position		
	3 rd	Encoder and decoder		
Week 8 th	1 st	Axis drives	1 st	Develop a part programme for the following milling operation and make the job on CNC milling Contouring - Pocket milling
	2 nd	other classifications of CNC machines- Feedback, motion , positioning.		
	3 rd	Mock Test		
Week 9 th	1 st	Part Programming -Part programming and basic procedure of part programming,	1 st	Preparation of work instructions for machine operator
	2 nd	NC words, Blocks, part programming formats,		
	3 rd	simple programming for rational components (Point to point, Straight line, curved surface),		
Week 10 th	1 st	tool off sets, cutter radius compensation and wear compensation	1 st	Practice
	2 nd	Advanced structures: Advantages of using advanced structures		
	3 rd	part programming using canned cycles,		
Week 11 th	1 st	subroutines and do loops, mirror image	1 st	Preparation of preventive maintenance schedule for CNC machine.
	2 nd	Problems in CNC Machines - Common problems in CNC machines related to mechanical, electrical		
	3 rd	Common problems in CNC machines related to pneumatic, PC components & electronic components.		

Week 12 th	1 st	diagnostic study of common problems and remedies,	1 st	Demonstration through industrial visit for awareness of actual working of FMS in production.
	2 nd	use of on-line fault finding diagnosis tools in CNC machines, methods of using discussion forums, environmental problems.		
	3 rd	Automation and NC system- Automation, suitability of production system to automation		
Week 13 th	1 st	types, emerging trends in automation, automatic assembly,	1 st	Use of software for turning operations on CNC turning center
	2 nd	manufacture of printed circuit boards, manufacture of integrated Circuits		
	3 rd	Overview of FMS, AGV, ASRS, Group technology,		
Week 14 th	1 st	CAD/CAM and CIM	1 st	Use of software for milling operations on machine centres.
	2 nd	Automated Identification system ,		
	3 rd	concept of AI, Robotics, nomenclature of joints, motion		
Week 15 th	1 st	Revision	1 st	Viva question
	2 nd	Revision		
	3 rd	Test		