Lesson Plan

Name of the Faculty : Sh. Deepak Malhotra

Discipline : Mechanical Engineering

Semester : 5th

Subject : CNC Machining and Automation

Lesson Plan duration : 17 weeks (01.10.2021 to 28.01.2022)

Work load per week : Lecture – 03, Practical – 04

Week	Theory	
	Lecture Day	Topic (Including assessment/test)
1st	1st	Subject introduction and overview
	2nd	**1. Introduction:** Introduction to NC, Components of NC, binary Coding
	3rd	Machine Control Unit, input devices
2nd	4th	Advantages, disadvantages of NC over Conventional machine, CNC & DNC
	5th	Their type, Advantages & disadvantages and Applications
	6th	Selection of components to be machined on CNC machines
3rd	7th	Problems with conventional NC, Axis identification
	8th	New development in NC, PLC Control and its purpose.
	9th	**2. Construction and Tooling:** Design features, special mechanical design features, specification Chart of CNC machines
4th	10th	Type of slide ways, balls, roller, motor-servo/stepper and Axis drive
	11th	Lead screw, recirculating ball screw & nut assembly Swarf removal, safety and guarding devices
	12th	Various cutting tools for CNC machines
5th	13th	Overview of CNC tool holder
	14th	different pallet systems and automatic tool changer system

	15th	Tool change cycle, management of a tool room.
6th	16th	**3. System Devices:** Control System; Feedback control classification(Open Loop and Closed Loop System)
	17th	Concept of Actuators, Transducers and Sensors
	18th	Tachometer, LVDT,
7th	19th	**1st sessional test (Tentative)**
	20th	**Assessment**
	21st	Opto-interrupters, potentiometers for linear and angular Position
8th	22nd	Encoder and decoder and axis drives, other classification of CNC feedback, motion, positioning.
	23rd	**4. Part Programming:** Introduction to Part programming
	24th	Basic concepts of part programming, NC words, Blocks
9th	25th	Part programming formats, simple programming for rational components(PTP, Straight Line, Curved Surface)
	26th	Tool offset, cutter radius compensation, Wear compensation,
	27th	Advamced Structure: Advantages of using advanced structure, part programming using conned cycles,
10th	28th	subroutines and do loops and mirror image
	29th	**5. Problems in CNC Machines:** Common problems in CNC machines related to mechanical component
	30th	Common problems in CNC machines related to electrical component
11th	31st	**2nd sessional test (Tentative)**
	32nd	**Assessment**
	33rd	Common problems in CNC machines related to pneumatic components.
12th	34th	Common problems in CNC machines related to electronic components.
	35th	Study of common problems and remedies, use of on-time fault finding diagnosis tools in CNC machines,
	36th	Method of using discussion forums, Environmental problems
13th	37th	**6. Automation and NC system:** Concept of automation
	38th	Suitability of production system to automation, and their types
	39th	Emerging trends in automation Automatic assembly, Manufacturing of

		PCB, manufacturing of IC,
14th	40th	Overview of FMS, AGV
	41st	ASRS, Group Technology, CAD/Cam& CIM
	42nd	Automated Identification system, Concept of AI
15th	43rd	Robotics, nomenclature of joints, motion
	44th	**3rd sessional test (Tentative)**
	45th	**Assessment**
16th	46th	Revision
	47th	Revision
	48th	Revision
17th	49th	Revision
	50th	Revision
	51st	Revision